

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 79: No. 2. New York, Thursday, January 10, 1907.

\$5.00 a Year, including Postage.  
Single Copies, 15 Cents.

Reading Matter Contents.....page 162  
Alphabetical Index to Advertisers " 191  
Classified List of Advertisers " 182  
Advertising and Subscription Rates " 190



FORSTER PULLEY WORKS, Cuba, N. Y.

The American Mfg. Co.  
Ropes and Twines  
65 Wall Street, New York



THE BRISTOL COMPANY  
Waterbury, Conn., U. S. A.  
New York: 114 Liberty St.  
Chicago: 756 Monadnock Bldg.  
Bristol's Recording Instruments  
For Pressure, Temperature  
and Electricity.  
Simple, Accurate, Reliable.  
All Ranges, Low Prices, and Guar-  
anteed. Send for Catalog R.

## SAMSON SPOT CORD



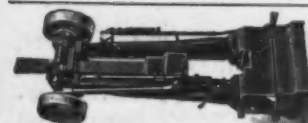
Also Linen and Italian Hemp  
Rush Cord.

SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES



Branch Office, 11 Broadway, New York.  
Cleveland City Forge and Iron Co., - Cleveland, O.



DROP  
HAMMER  
MERRILL  
BROS.,  
BROOKLYN,  
N. Y.

## SOFT COAL.

Pilling & Crane Girard Building, Phila.  
Macheneys Bldg., Pitts'g  
Empire Bldg., New York

All Our Brands of

## Roofing Tin

showing the weight of coating  
carried per box of 20 x 28—  
112 sheets

are shown on Page 16.

This cannot fail to interest you.

AMERICAN  
SHEET & TIN PLATE  
COMPANY

Frick Building

Pittsburgh, Pa.

## Remington Autoloading Shotgun



### IT LOADS ITSELF

The modern duck gun. It loads itself by using its own recoil—thus sparing the shooter's shoulder. A hammerless 5 shot repeater with absolutely safe, solid breech. List price, \$40, subject to dealer's discount.

Write to New York address for circulars.

Remington Arms Company  
ILION, N. Y.  
Agency: 315 Broadway  
New York City.

## WATER TUBE BOILERS

The Babcock & Wilcox Co.  
85 Liberty Street  
New York

See page 54

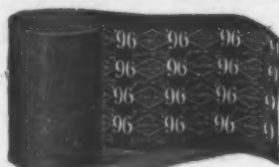
## Thousands of Testimonials

received from practical men in the horseshoeing business confirm our claim:— That the most exacting requirements of the most severe service are SUCCESSFULLY met by "The Capewell" nails—the STRONGEST horseshoe nail in the world.

It Will Pay You Well Always to Insist Upon Having This Brand

MADE BY

The Capewell Horse Nail Company,  
HARTFORD, CONN.



## Jenkins '96 Packing

is preferred by all engineers who have ever had the opportunity to gain a full knowledge of its merits. It makes perfect joint instantly. It gives longest satisfactory service. It is guaranteed. Write for booklet.  
JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

"Swedoh" Cold Rolled Steel is unexcelled for Drawing and Stamping  
THE AMERICAN TUBE & STAMPING COMPANY  
(Water and Rail Delivery) BRIDGEPORT, CONN. SEE PAGE 18.



## MAGNOLIA METAL.

Best Anti-Friction Metal for all Machinery Bearings

Fac-Simile of Bar.  
Beware of  
imitations

MAGNOLIA METAL CO.,

Owners and Sole Manufacturers, 113-115 Bank Street,  
Chicago, Fischer Bldg. NEW YORK

San Francisco, Montreal and Pittsburg.  
We manufacture all grades of Babbits  
Metals at competitive prices.

**SOME,**  
and we guess  
most, people  
**ARE NEVER  
SATISFIED!**

Now that our New  
Open Hearth Steel  
Works are finished  
and running, like our  
Tin Plate and Black  
Sheet Mills, Full, the  
volume of business in  
hand, and in sight, makes  
us wish the Entire  
Plant were many times  
larger and we meant  
to build away ahead  
of probable require-  
ments!!!

**FOLLANSBEE  
BROTHERS  
COMPANY**  
Pittsburgh  
and  
Branches.

## SHOE NAILS **BRASS**

### 4 PLAIN STRAIGHT FACTS

- 1st. The best produced. A strong statement, but the goods prove it.
- 2d. Brass cast and rolled on the premises. Care is taken in the stock, which is clean, ductile and the right temper.
- 3d. Inspection rigid; packages contain perfect nails only. No splinters nor imperfect heads.
- 4th. Packed in 2 oz. and 4 oz. metal boxes. 2oz., 4oz., 1/4 lb. and lb. papers. One dozen packages in a carton. All goods full weight. Get our prices.

**RIVER COMPANY,**  
Waterbury, Conn.

## Bridgeport Deoxidized Bronze & Metal Co.

BRIDGEPORT, CONN.

Phosphor and Deoxidized  
Bronze

Composition, Yellow Brass and Alumi-  
num Castings, large and small

## THE PLUME & ATWOOD MFG. CO.

MANUFACTURERS OF

## Sheet and Roll Brass

—AND—

## WIRE

PRINTERS' BRASS, JEWELERS' METAL,  
GERMAN SILVER and GILDING METAL, COP-  
PER RIVETS AND BURRS.

Pins, Brass Butt Hinges, Jack Chain, Kero-  
sene burners, Lamps, Lamp  
Trimings, &c.

29 MURRAY ST., NEW YORK.  
199 LAKE ST., CHICAGO.

ROLLING MILL:  
THOMASTON, CONN.

FACTORIES:  
WATERBURY, CONN.

## SCOVILL MFG. CO.

MANUFACTURERS OF

**BRASS,  
GERMAN SILVER,  
Sheets, Rolls, Wire Rods,  
Bolts and Tubes,  
Brass Shells, Caps, Hinges,  
Buttons, Lamp Goods,  
Special Brass Goods to Order.**

FACTORIES:  
**WATERBURY, CONN.**  
DEPOTS  
NEW YORK. CHICAGO. BOSTON.

## Henry Souther Engineering Co.

HARTFORD, CONN.

Consulting Chemists, Metallurgists  
and Analysts.

Complete Physical Testing Laboratory.  
Expert Testimony in Court and Patent Cases.

## Arthur T. Rutter & Co.

256 Broadway  
NEW YORK

Small tubing in Brass, Copper,  
Steel, Aluminum, German Silver,  
&c. Sheet Brass, Copper and Ger-  
man Silver. Copper, Brass and  
German Silver Wire. Brazed and  
Seamless Brass and Copper Tube.  
Copper and Brass Rod.

## THE BRIDGEPORT BRASS CO., BRIDGEPORT, CONN.

Postal Telegraph Building, Broadway  
and Murray St., New York.  
85-87 Pearl St., Boston.  
17 N. 7th St., Philadelphia.

MANUFACTURERS OF

**Brass** { **SHEET**  
**AND** **TUBING**  
**Copper** **WIRE**

Metal Goods made to order from  
Sheet, Rod, Wire and Tubing.



**PHOSPHOR-BRONZE  
GERMAN SILVER**

**THE RIVERSIDE  
METAL CO.**  
RIVERSIDE, N. J.

## Matthiessen & Hegeler Zinc Co.,

LA SALLE, ILLINOIS.

### SMELTERS OF SPELTER

AND MANUFACTURERS OF

### SHEET ZINC AND SULPHURIC ACID.

Special Sizes of Zinc cut to order. Rolled Battery Plates.  
Selected Plates for Etchers' and Lithographers' use.  
Selected Sheets for Paper and Card Makers' use.  
Stove and Washboard Blanks.

ZINCS FOR LECLANCHE BATTERY.

## BRASS FOUNDERS FINISHERS **J. J. RYAN & CO.**

105-109 So. Jefferson St., Chicago.  
Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS  
On Short Notice

## GERMAN SILVER | NICKEL ANODES

**BRASS, BRONZE, and COPPER**  
**The Seymour Mfg. Co., - - Seymour, Conn.**

## HENDRICKS BROTHERS

PROPRIETORS OF THE

## Belleville Copper Rolling Mills,

MANUFACTURERS OF  
**Braziers' Bolt and Sheathing  
COPPER,  
COPPER WIRE AND RIVETS.**

Importers and Dealers in  
Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.  
49 CLIFF ST., NEW YORK.









# THE IRON AGE

New York, Thursday, January 10, 1907.

## Development of Tunneling in New York City.

A Few of the Things That Have Been Accomplished Beneath the City and Under the Rivers.

BY S. D. V. BURR.

New York City has been long celebrated as the place par excellence for the study of bridges, whether of the plate and latticed girder type mounted on columns as used for the elevated railroads, or of mammoth structures of the suspension and stone and arch patterns. Considering these as representing the two extremes, the student of bridge engineering may also find at least one example of almost every intermediate type. New York has taken the initiative along certain lines of bridge development, as witnessed by that wonderful contribution to the science

monument to the ability of the engineers in charge and would be of vast benefit to the profession.

### The Beach Pneumatic Tunnel.

One of the earliest and most interesting attempts to solve the rapid transit problem in New York City was that put forward by A. E. Beach, editor of the *Scientific American*, who incorporated the Beach Pneumatic Transit Company in 1868. The charter wisely demanded practical proof that the scheme was feasible. The company had to



Fig. 1.—The Beach Broadway Tunnel, Erected in 1869.

of bridge building—the Brooklyn Bridge, opened 24 years ago—and the city has always maintained the advanced position then attained.

Still another division of engineering is indebted to New York for contributions of marked originality, and which are destined to be of the greatest benefit in future operations the world over. The tunneling already accomplished beneath the city and rivers has been distinguished by many bold methods which will surely find application in similar work under like conditions. In both the Subway and river tunnels conditions were encountered repeatedly which could not be dealt with along the old lines; underground work of a character heretofore impossible was successfully completed—these problems all demanded new and original solutions. It is the purpose in the following to mention briefly a few of the most important works that have been done. To treat the subject of New York's accomplishments in tunneling would require a volume of large proportions, but it would be a

first "lay down pneumatic tubes from the Post Office in Nassau street," and continue their operation for a period of three months "before proceeding to lay down and construct other lines of such pneumatic tubes." The tunnel was to be operated by compressed air, the car was circular in section and approximately fitted the tube.

Work was begun at Warren street on Broadway and carried south to Murray street. The tunnel was constructed with a shield forced forward 2 ft. at a time by hydraulic jacks interposed between the rim of the shield and the section already finished. On the curved portion the tunnel was lined with cast iron curved plates, and was of larger diameter than the straight bricked parts, as shown in the engraving, Fig. 1, which is from the *Scientific American*.

In 1870 the tunnel was thrown open for inspection, and a car was run back and forth. But people were skeptical and mistrusted the plans. One of the principal objections was that such a structure carried through

Broadway at a depth of 20 ft. below the surface would endanger such then tremendous buildings as the Astor House. Mr. Beach was far ahead of his times and people

of how subaqueous tunneling should be done. He organized a company, obtained charters and began the construction of the Hudson River tunnel from Fifteenth street,

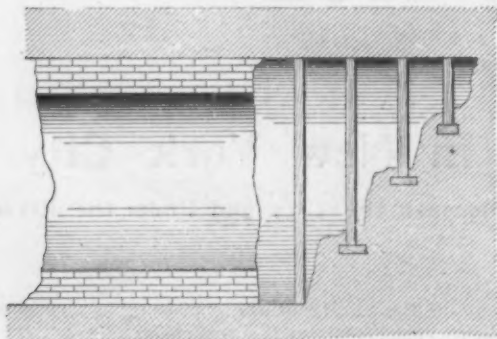


Fig. 2

Tunneling through Silt with Unprotected Heading.

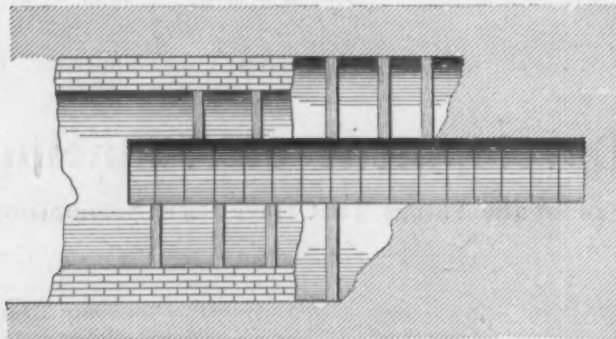


Fig. 3

THE IRON AGE

Tunneling with a Pilot through Silt.

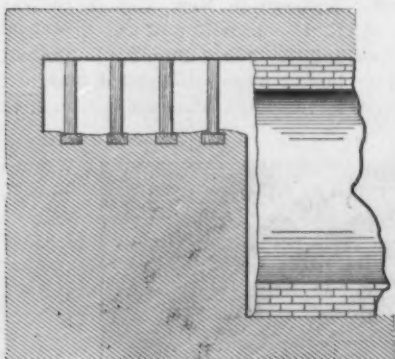


Fig. 4

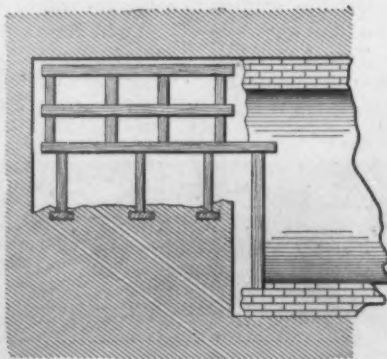


Fig. 5

Tunneling through Sand.

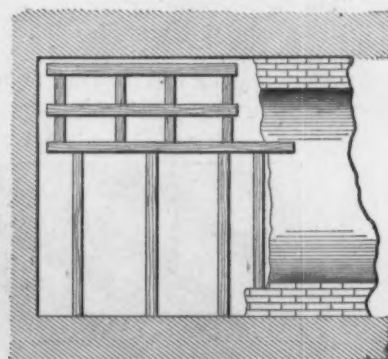


Fig. 6

THE IRON AGE



THE IRON AGE

Fig. 7.—View in the Tunnel Looking Toward the Heading, Showing the Radial Struts Resting on the Pilot.

#### THE OLD HUDSON RIVER TUNNEL.

had not been educated to the safety and convenience of underground traveling.

#### The Old Hudson River Tunnel.

During the 70's D. C. Haskin came to New York with several hundred thousand dollars and a new conception

Jersey City, to Morton street, New York. His plans had the hearty and unanimous disapproval of the entire engineering profession; on his part he had unbounded contempt for members of the civil engineering profession, individually and collectively, and he was by no means backward in expressing his opinion. Nevertheless, he was

a brave man financially; he spent his own money and built several hundred feet of tunnel according to his own plans before asking any outside assistance.

The plan certainly had the recommendation of extreme simplicity. It presupposed that the silt composing the bed of the river was of such consistency as to present

the silt, after the excavation had been enlarged to the full diameter of the bore, would be tenacious enough to hold its position until the lining plates and brick work could be built.

All these suppositions proved to be true, and work was carried on as shown by the sketch, Fig. 2. The face of

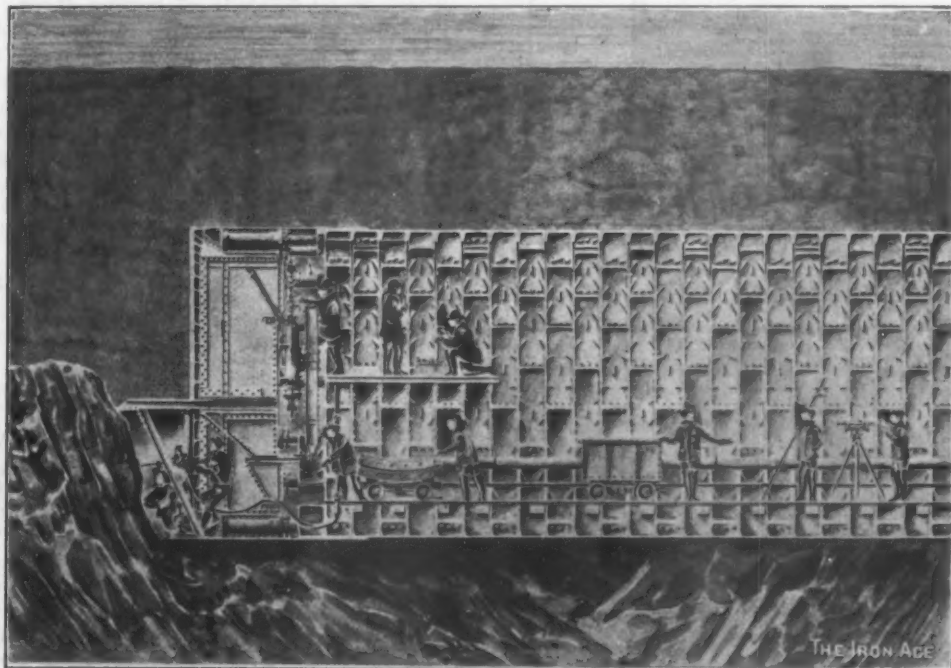


Fig. 8.—Tunneling through Rock and Vitrifying the Clay in the Heading.

#### THE OLD HUDSON RIVER TUNNEL.



Fig. 9.—Open Cut through Elm Street.

#### THE NEW YORK SUBWAY.

a barrier or partition and divide the working chamber or heading from the water, provided the air pressure maintained inside was always equal to the hydrostatic head outside. If this proved true, then the face of the heading would require no support whatever, and the excavation could be carried on in the same manner as an open cut through a hill. Further, it was supposed that

the heading was stepped or terraced for the convenience of the men, and the crown was kept 8 or 10 ft. in advance of the invert. As soon as a space had been uncovered a plate was inserted, bolted to those already in and then braced with timbers. When a section 10 ft. long had been lined throughout, the brick masonry, 30 in. thick, was built, leaving the tunnel 16 x 18 ft. in internal



diameter. More or less difficulty was always experienced in keeping the air at exactly the right pressure. The vertical diameter of the excavation was 23 ft., making a difference in the water pressure between the crown and

finished it meant abandoning the undertaking or devising a better plan.

#### Tunneling with a Pilot.

Relief was afforded by the pilot designed by J. F. Anderson, superintendent of the tunnel, who reasoned that if a central hub could be provided against which to brace the plates until the masonry could be built there would be no difficulty in holding grade. The so-called pilot was a tube, Fig. 3, built of boiler iron plates 22 in. wide by 48 in. long and flanged. It was 6 ft. in diameter and generally from 50 to 60 ft. long. The rear end was substantially braced in the completed tunnel, while the forward end extended into the undisturbed silt in advance of the heading, affording a firm and rigid foundation from which to support the plates. The pilot was used until the heading had been advanced some 1800 ft. from the shaft, and there was no trouble in holding accurate grade. When, about 15 years later, a new management assumed control it was discarded in favor of the shield.

#### Subaqueous Tunneling Through Sand Without a Shield.

At the eastern end of the tunnel the shaft entered sand and gravel. This was penetrated by a system of poling and plate diaphragms, as indicated in Figs. 4 to 6, designed by S. H. Finch, the chief engineer. The method adopted at the other end was obviously impossible here. After the caisson had been sunk full depth

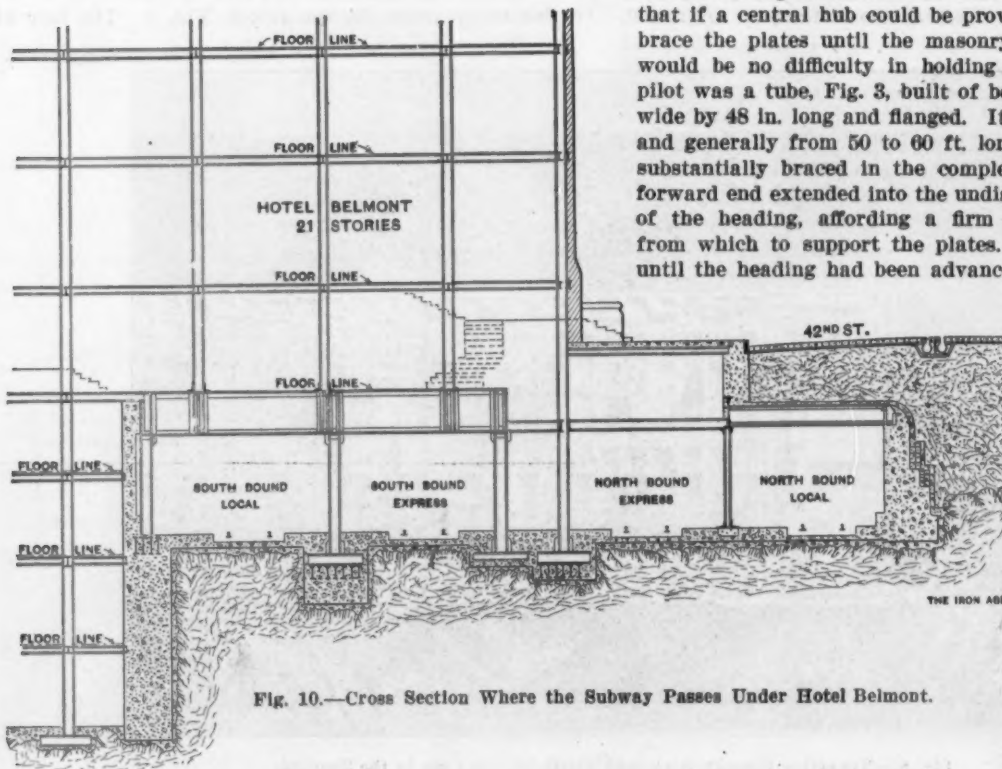


Fig. 10.—Cross Section Where the Subway Passes Under Hotel Belmont.

invert of about 11 lb. per square inch, while the air pressure throughout was of course the same. When the air pressure was held equal to the water pressure at the crown the water entered at the invert; an air pressure equal to the invert water pressure permitted the air to escape too readily through the crown. Practice proved that the best general pressure was that a little below the hydrostatic head at the axis of the tunnel.

The plates were of  $\frac{1}{4}$ -in. boiler iron  $2\frac{1}{2}$  ft. wide by  $3\frac{1}{2}$  ft. long, and were flanged upon the four sides with angle iron. Four rings of plates constituted a section ready for the masonry. The air pressure varied from 18 lb. at the start to 36 and 38 lb. at a distance of 1800 ft. from the shaft.

Four hundred feet of tunnel built according to this method demonstrated its practicability, but developed a most serious fault that became aggravated the further the heading was advanced. It was impossible to preserve the alignment of the tunnel. The work has since been finished, but the old north tunnel now shows a most erratic grade line. Between the excavation and the bricking the section would settle, and by a varying amount that could not be allowed for, because the consistency of the silt varied. If the excavation were carried a little high, expecting it to settle to proper grade, it was likely to settle too much or too little. This uncertainty precluded accurate work and became so serious that when about 400 ft. had been

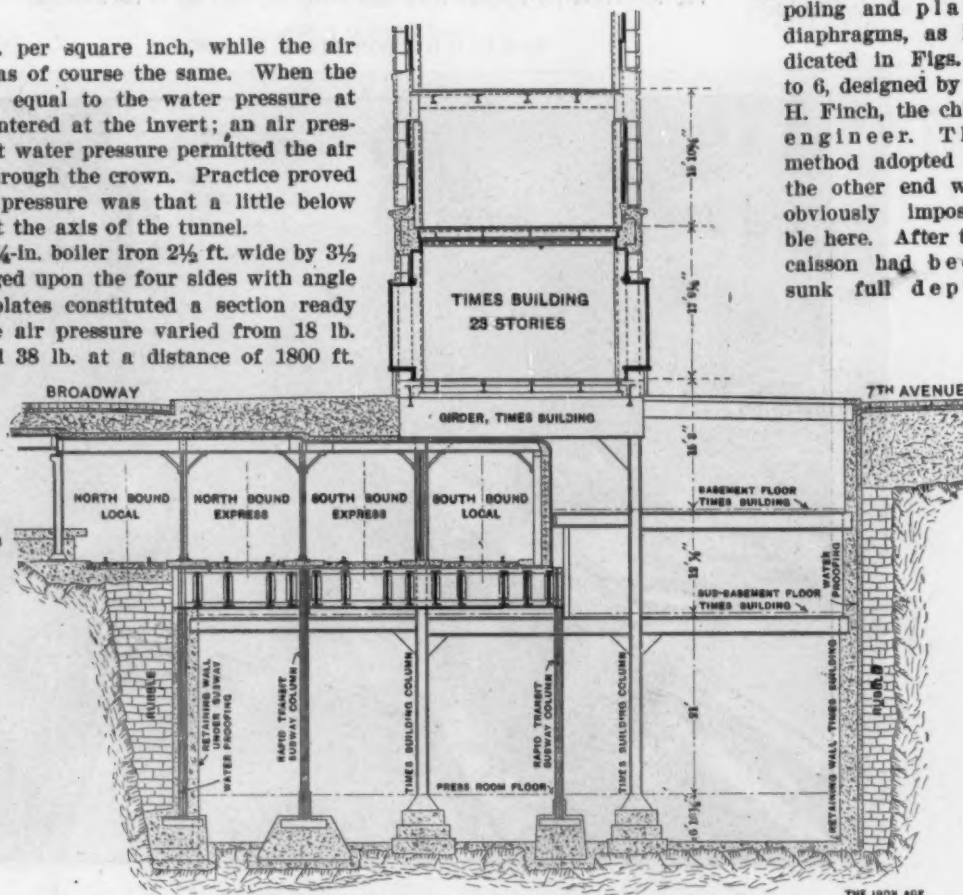


Fig. 11.—Cross Section Where the Subway Passes Under the Times Building.

#### THE NEW YORK SUBWAY.

an opening was cut in the side toward the river and a bulkhead the full size of the tunnel built of  $\frac{1}{4}$ -in. plates braced against the side of the caisson. The real work was then started. A plate at the crown was removed and the sand excavated sufficiently to permit a small plate to be placed horizontally and bolted to those ahead in

position. This operation was repeated in a forward direction and down each side as far as possible before the next row of plates in the bulkhead was removed. When this crown had been extended 10 ft., as shown in

excluded by the air pressure. As soon as a section 10 ft. long had been opened it was lined with masonry.

Where the material was exceptionally loose poling strips were pushed ahead and then drawn back until their

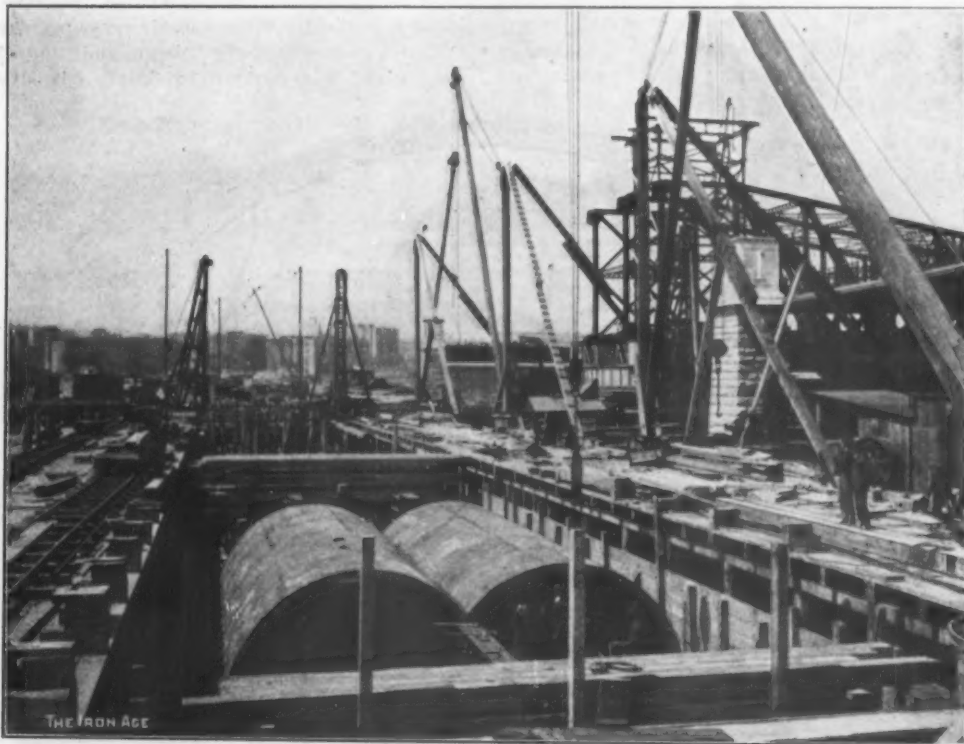


Fig. 12.—Constructing the Twin Tunnels Under the Harlem River.



Fig. 13.—View of Erector in the East River Section.

#### THE NEW YORK SUBWAY.

Fig. 4, a second plate bulkhead was begun. The upper edge of the rear bulkhead was always kept at a higher elevation than the lower edge of the forward one, thereby forming a sort of diving bell from which the water was

ends rested upon the plates already in place. In other cases hydraulic cement was forced into the soft material and the excavation carried on after the first method. The method was exceedingly slow and somewhat dangerous,



but notwithstanding this some 1800 ft. of tunnel were constructed in this way.

The methods just outlined, being slow, were very expensive. The difficulties under which the men had to work will be appreciated from Fig. 7, which is a view looking toward the heading along the top of the pilot. The braces for the plates are many and very close together. The work was not dangerous as far as the men were concerned—the records show that not a man was killed at

the center line of the tunnel. When the shield met this obstruction blasting was necessary and trouble immediately arose, because over the rock was a mixture of silt and clay which offered little resistance to the passage of air. The drilling had to be done in advance of the cutting shoe of the shield, and to do the work the men had to leave the shield. When the air pressure was reduced the silt and clay would flow down and stop the operation. To prevent this, partially at least, a hood was built out

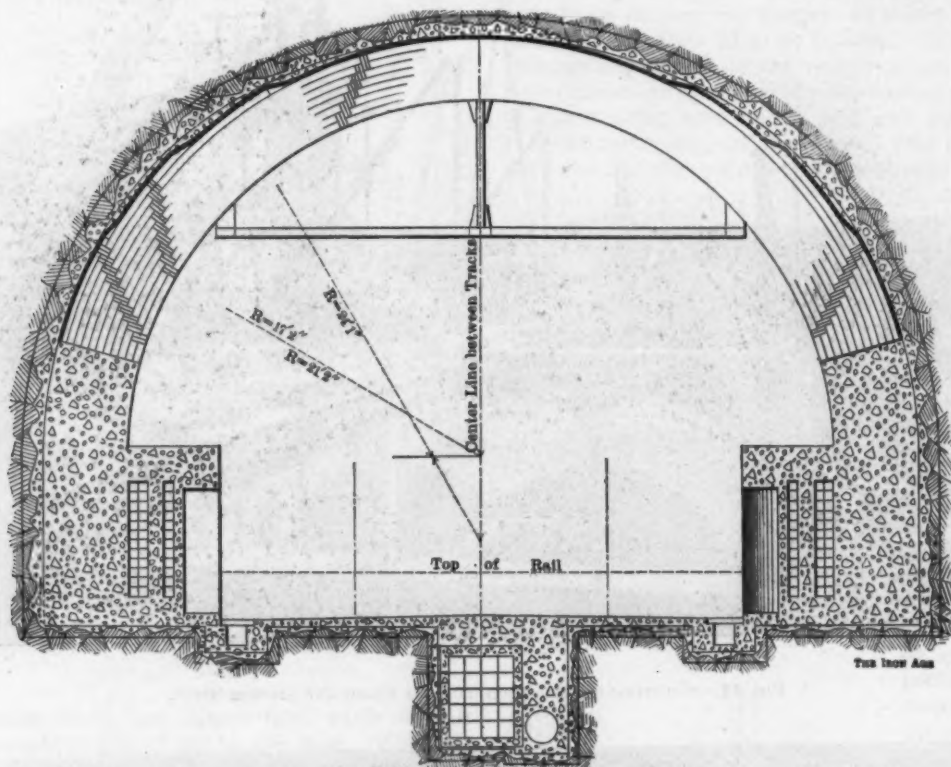


Fig. 14.—Cross Section of Double Track Tunnel.

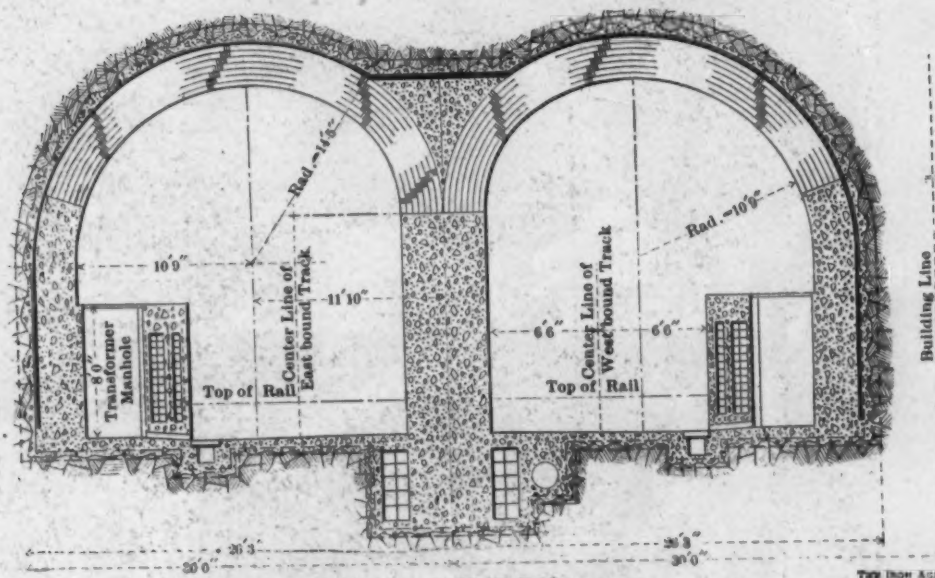


Fig. 15.—Cross Section of Twin Tunnels.

#### THE PENNSYLVANIA TUNNELS.

the heading; blowouts were somewhat frequent, but they did but little damage beyond flooding the work.

All three methods may be ranked as monumental curiosities in subaqueous tunneling, and although they were successful to a degree, will never be seriously advanced again, probably not even as a makeshift.

#### The Vitrifying Process Applied to Subaqueous Tunneling.

When the present management of the old Hudson River tunnel assumed control, under Chas. M. Jacobs as chief engineer, it was known that a peak of rock would be encountered near the New York shore, rising about to

from the face of the shield, as shown in Fig. 8, and the exposed silt was heated with blow torches, vitrifying it sufficiently to prevent its flow into the work. The vitrifying process was carried on with a supply of gasoline and compressed air brought in tanks into the heading. After this plan had been adopted the work was pushed forward through the rock without undue trouble.

#### The New York Subway.

In a work as vast and varied as the New York Subway it is hard to select the most interesting and valuable features, judged from an engineering standpoint. In its entirety the Subway presents examples of almost every



type of tunneling, and has had to deal with problems of greater variety and difficulty than any single undertaking through like material all the way. The methods adopted

cavation type, with the rail level as close to the street surface as the grades and local conditions would permit, and is flat roofed to save the head room required by

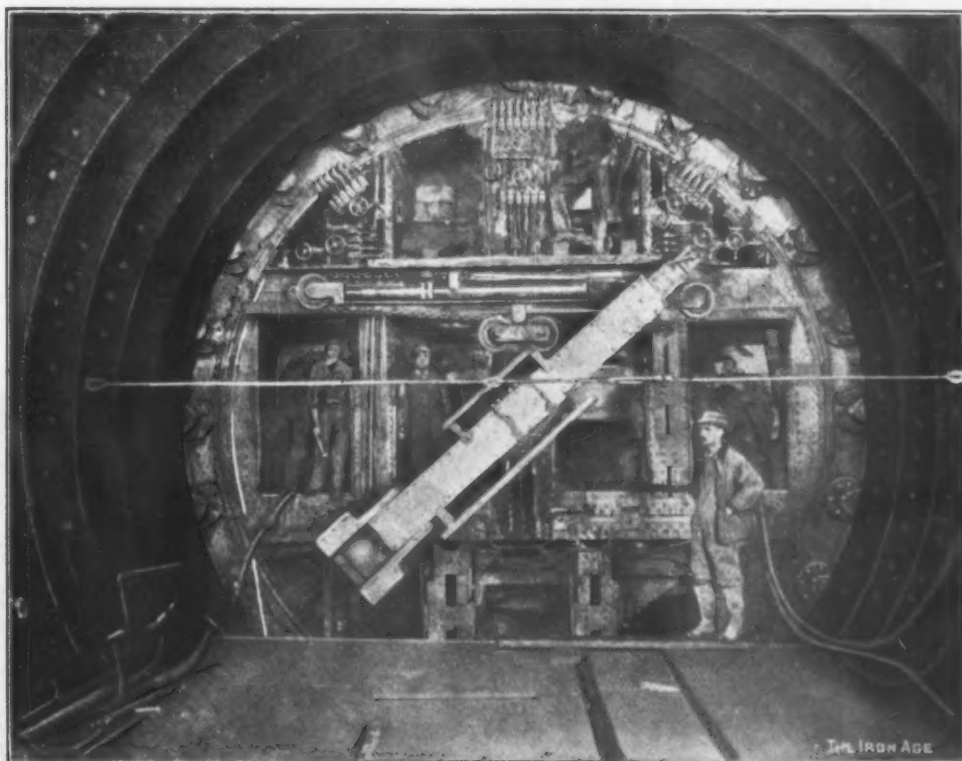
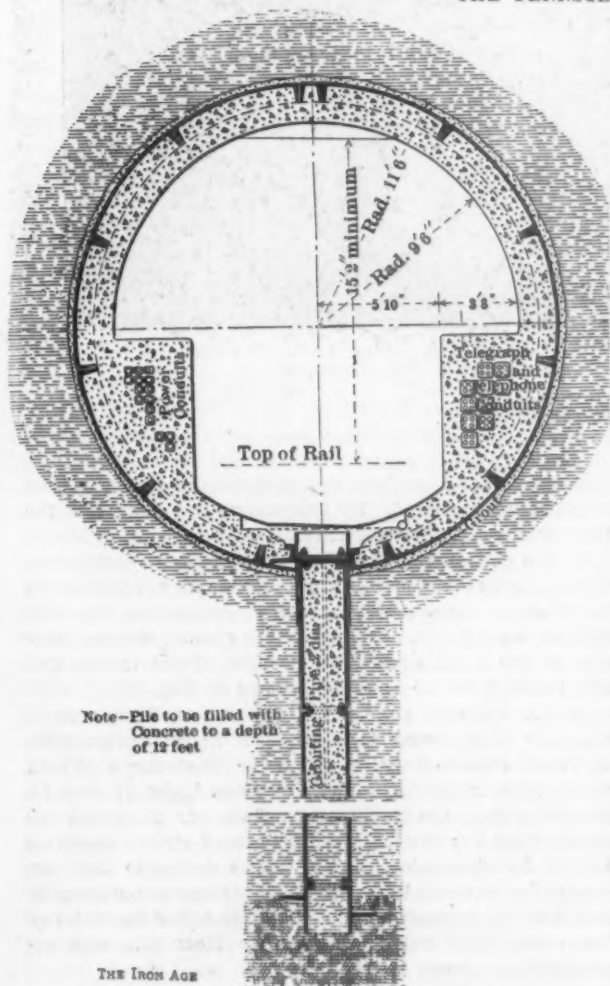


Fig. 16.—View of Shield and Plate Erector.

#### THE PENNSYLVANIA TUNNELS.



Note—Pile to be filled with Concrete to a depth of 12 feet

THE IRON AGE

Fig. 17.—Tunnel Section through a Screw Pile.

were always those best suited to the conditions, and as the conditions changed so the plans altered.

The larger part of the Subway is of the shallow ex-

arches. The minimum distance between the top of the tunnel and the street surface was 30 in., that being the depth of the electric railroad conduits. The principal type was a rectangular tunnel consisting of a floor of steel ribs having arches turned between them. The steel frames were then erected, the jack arches turned and the roof waterproofed and concreted. Columns were introduced between the tracks for the purpose of further reducing the thickness of the roof.

The true tunnels were semicircular in section, with the exception of that under Murray Hill, which was a three-center arch adopted in order to lower the roof. Arches were also used on some of the two-track lines where the roof space permitted, as the arch was found to be cheaper than the steel frame construction.

#### Open Cut Along Elm Street.

An idea of the method of carrying on the work in open cut through Elm street and also the design of the Subway will be obtained from Fig. 9. A portion of this line runs through wet ground and at Canal street is below tide level. Sheet piling was used along the sides of the cut, which was driven through the loose filling to close sand. Afterward the water was pumped out and the concrete floor and waterproofing laid. Then followed the roof beams and arches.

In many localities it was most difficult to properly dispose of the sewer, water and gas pipes, and particularly so at Canal street, where the headroom was limited to a few inches. In such cases the large main was divided into smaller pipes having a capacity equal to the large one. At certain cross streets, where the distance between the roof and surface was not sufficient to admit of lateral and longitudinal mains crossing each other, a flat metal trough was built between adjacent roof beams and the lateral mains placed in it. The bottom of the trough was made of 3-in. beams resting on the flanges of the roof beams, and having concrete between them.

#### Open Cut Along Upper Broadway.

Broadway, between Sixtieth and 104th streets, has a roadway 102 ft. wide, with a parkway in the center, upon each side of which is an electric railroad conduit.

Through wooden trusses were constructed under each side of each track, and needle beams were suspended from the trusses beneath the tracks. The trusses themselves were carried upon beams. The work of excavation was done through the parkways and then laterally under the trusses. By this means the railroad was not endangered nor travel interrupted.

On Park Row a trench was excavated on each side of the four surface tracks down to grade. Drifts were then cut under the tracks, which were supported upon timbers from the bottom. During this work a temporary roadway was supported upon wooden posts, the street traffic being confined to the four tracks.

#### Cable System Along Fourth Avenue.

Along Fourth avenue from Great Jones street to Thirty-third street the excavation was made the full width of the tunnel. The surface tracks were carried over the opening, and the street travel was confined to

and express tracks of the Subway was then blasted out and the steel work erected.

#### Rock Excavation Along Forty-second Street.

The difficulties presented along this portion of the line were many and great. The work was in rock all the way and the street traffic was very heavy at all times. To interfere as little as possible with this traffic the operations were confined to the south side of the street, along which a trench was dug for a width of 15 ft., and in this opening the track for the south bound local trains was laid. A drift was then opened at the level of the roof in a northerly direction—across the street—for about 20 ft., and heavy steel beams were placed in position. One end of the beams rested on the completed roof and the other end on the unexcavated rock. The street surface was supported on these beams by blocking. Excavation was then made beneath the beams for the south bound express track. The side drift was then carried for-

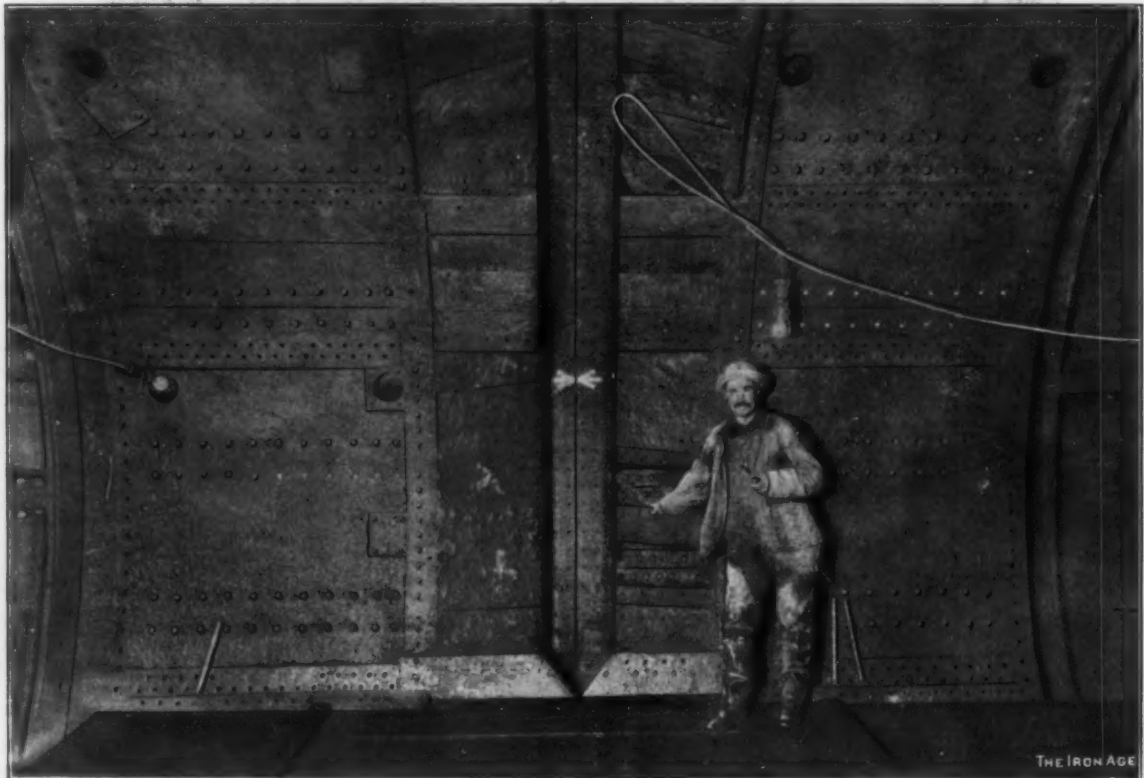


Fig. 18.—The Meeting of the Shields, Showing How Perfectly They Registered.

#### THE PENNSYLVANIA TUNNELS.

the track space, thereby temporarily cutting off direct access to the houses on each block. At important buildings or where the business demanded it, the excavation was bridged or arrangements made to truck merchandise from the nearest cross street. The surface tracks were supported by a pair of 24-in. beams 40 ft. long placed on the outside of the track and at the side of the excavation, a similar pair being placed in a trench which was afterward roofed with planks. The ends of the beams were supported on wooden trestles. As the cut progressed timber beams were placed across and beneath the tracks and suspended by rods from the longitudinal steel beams. In this way all the soil was removed from under the surface tracks, thereby leaving all the space from the curb to beyond the center line of the street free for the construction of the subway. The room thus secured was sufficient to permit the erection of the center row of columns. The excavated material was removed by overhead cableways on towers arranged longitudinally with the cut at each opening; where rock was found a derrick was set up.

At Union Square the surface tracks were removed near the east curb in order to avoid all danger of injury to them when blasting, as the rock at this point came very near the surface. Space for the south bound local

ward for another section, the steel beams advanced and the operation repeated. By this means the surface of the street was kept intact for traffic.

At the east end of the Forty-second street section the Subway passes under the Hotel Belmont, a building 21 stories high. An unusual amount of excavation was here required, as the rock came above the ground surface over most of the hotel site. The location of the tracks and their relation to the hotel are shown in Fig. 10.

At the opposite end of the section, at Broadway, a still more troublesome task was met in connection with the Times Building, which was to be 23 stories high and was to have a pressroom with a clear height of 19½ ft. directly beneath the tracks of the Subway. A station extending from Forty-second to Forty-third streets was also planned for this point. Since it was desirable that the Subway trains should not affect the presses or building by vibration, the supports for the building and of the Subway were constructed entirely separate. How this was accomplished is shown in Fig. 11.

#### Tunneling Under the Harlem River.

That portion of the Subway extending beneath the Harlem River was tunneled by an entirely new method, designed and carried out successfully by D. D. McBean, of the firm having the contract for that section. While



the Government required that the river be kept open for navigation, it permitted it to be temporarily narrowed. The first work was the dredging of a channel across the river bottom to nearly the full depth of the excavation needed for the tunnel. In this channel foundation piles and a row of 12-in. sheet piling were driven along each side and across the ends. These timbers were cut off in a true horizontal plane about 25 ft. below the water surface. On the tops of these timbers was lowered a roof 40 in. thick, completely covering the tunnel section. The water was then pumped from the chamber thus formed and at the same time compressed air was forced into the chamber at a pressure corresponding to the depth of water above the roof. Inside the chamber the west half of the tunnel was built and then the roof was removed.

A more expeditious, simpler and cheaper method was adopted in constructing the easterly half of this tunnel. The sides of the working chamber were built in the same way as before, but the sheeting was cut off about 12 ft. lower, or exactly at the level of the spring line of the arch of the tunnel. The top halves of the twin tunnels were then built on pontoons, floated over the place and then lowered until they rested upon the sheeting, being guided into position by flanges which had been built upon their sides. These formed the working chamber roof. The bottom half and foundation of the tunnel were then constructed with the aid of compressed air. A portion of this work is shown in Fig. 12.

The twin tunnels under the Harlem have a cross section in the form of two intersecting circles and are separated by a vertical central wall. They are lined with cast iron plates.

#### Work at Trinity Church.

The work on contract No. 2, which embraced the extension under the East River and through the streets of Brooklyn, presented many interesting problems. At Trinity Church borings showed that the foundations under the spire, which is 286 ft. high, were only 9 ft. 3 in. beneath the sidewalk, that they extended 52 ft. longitudinally and were 9 ft. from the wall of the Subway. The Subway here had a depth of 24 ft., and the excavation therefore had to be carried 15 ft. below the spire foundation. It was decided to divide a length of 57 ft. in front of the church into three sections, and to excavate the middle one first and to build within this the concrete floor and the concrete forming the platform bench and side wall. After this had been finished the other two sections were completed in the same way. In order not to leave voids when the sheet piling should be withdrawn, steel channels were used as piling and were left in place below the foundation level. As a further precaution concrete was rammed against the inside face of this piling.

The two tunnels under the East River have been constructed through solid and disintegrated rock by means of a shield. The tunnel lining is composed of eight segments of flanged plates and a key plate. Fig. 13 shows a portion of the completed tunnel and the manner of handling the plates by means of the erector, which was mounted upon a platform carrying the actuating machinery. This platform traveled on rollers placed along each side of the completed tunnel. The erector was pivoted upon a shaft located at the axis of the tunnel. Its outer end was arranged to grasp the plate and hold it in position until bolted to the plates already in place. At intervals along the length of the tubes there are rectangular connecting passages 8 ft. wide and 6 ft. high in the clear.

The work done on the Brooklyn division of the Subway constantly required the utmost care. All through Fulton street the route lay between comparatively old buildings, the foundations of which had to be safeguarded. Additional obstacles were presented by the lines of surface electric tracks and an elevated railroad structure, which had to be protected while the work was in progress and the street kept open as freely as possible. In all the Subway construction the engineers had less trouble from new tall buildings than from old buildings only a few stories high, the foundations of most of which could not be trusted, but had to be carefully supported. The foundations of new buildings could be relied upon and were approached, and in fact, gone under without

fear, and in no instance were they injured in the least.

With the 19 new lines planned by the Rapid Transit Commission, as described in *The Iron Age*, February 1, 1906, it is more than probable that new obstacles will appear which will call for new methods of construction, and the near future may see further remarkable developments in tunneling, both subaqueous and through dry ground.

#### The Pennsylvania Hudson River Tunnels.

In the work now being prosecuted by the Pennsylvania, New Jersey & New York Railroad under the Hudson appear many features of uncommon interest, and several of which mark long steps in the development of subaqueous tunneling. Innovations are presented in the designs and in the methods of construction. In cross section the single and twin tunnels shown in the sectional drawings, Figs. 14 and 15, have some characteristics in common. Upon each side of the track are placed telegraph, telephone and power conduits, above which are footways with occasional safety recesses. These recesses have their sides curved so as to present the smallest obstacle possible to a train in case of derailment.

The river tunnels are lined with cast iron or steel plates—11 segments and a key to the circle. The outside diameter is 23 ft. and the diameter inside the flanges 21 ft. 2 in. Although the greater portion of the tunnels was lined with cast iron plates, steel was employed where greater strength was demanded by the nature of the material encountered. The plates are larger than those heretofore employed in underground work in this country. The width of a plate, and therefore the length of a finished ring, is 30 in., and each segment is 77½ in. long. These segments vary in weight from 2000 to 2600 lb. Each is formed with a small central opening through which cement can be forced if necessary. At every 15 ft. along the center line of the tunnel is an opening through which the screw piles are to be sunk.

#### The Shield.

The shield is provided with nine pockets which can be closed by pivoted doors. It is forced forward by 24 hydraulic jacks arranged around the circumference just within the outer shell, and bearing against the edge of the finished tunnel. With a water pressure of 5000 lb. to the square inch the total forward thrust of all the 24 rams is 6,600,000 lb., which is equivalent to a pressure of 105 lb. upon every square inch of the face of the shield. The rams have a stroke of 38 in. and a piston diameter of 8½ in. A rear view of the shield in place is shown in Fig. 17. The shield is also provided with sliding platforms operated by independent rams, which can be projected forward to a line with the cutting shoe.

The plate erector, Fig. 16, is mounted upon a central shaft, about which it is revolved after a plate has been gripped at the outer end, and forces the plate forward into position for bolting. When grasped by the arm a segment is counterbalanced at a distance of 11 ft. from the pivot.

#### Screw Piles.

A novel feature in tunnel design original with Chas. M. Jacobs, the chief engineer, is found in the screw piles which will be placed at intervals of 15 ft. throughout the length of the tunnels. While the silt forming the bed of the river is sufficiently tenacious to hold the tunnels in perfect alignment during construction, it was not considered firm enough to do so when the tunnels are in use. It was thought that the impact of a heavy motor, if the weight were allowed to bear directly upon the shell, might set up stresses that would result in damage to the structure. To forestall this possible danger screw piles will be sunk to a solid foundation, and upon them the tunnel proper will rest. The piles will be 27 in. outside diameter and the shell will be 1¼ in. thick. The sections will be 7 ft. in length and will be bolted together through internal flanges, as shown in the section, Fig. 17. The lowest section will be cast with one turn of a screw 4 ft. 8 in. in diameter. These piles will be screwed down through the openings left in the lower line of plates with an electrically driven train of gearing which will have power



sufficient to exert a turning strain of 400,000 lb. upon the pile.

#### **Tunneling Without Excavating.**

The silt composing the bed of the river, while tenacious to a certain degree, can be forced aside. It of course offers resistance to the passage of a body through it, but at the same time it will yield to continued and powerful pressure. By taking advantage of this property the Pennsylvania tunnels have been pushed through the silt, and the tunnels now being run from Jersey City to Cortland street, New York, are using the same method. Absolutely no material is removed during the building. The shield acts as a huge plug which is forced through the silt, which moves one side to permit its passage. The result is that these tunnels mark the most rapid work of this character ever done and also at a cost far less than ever before reached. A record of 72 ft. during 24 hr. has been made on the Cortland street tunnel approaching from Jersey City. This means that this length

### **The Dahl Automatic Drill Grinder.**

A machine for sharpening twist drills which is claimed to be the only one on the market that will do the work entirely automatically is shown in the illustrations herewith. It is manufactured in this country by Manning, Maxwell & Moore, New York City, and is the invention of J. J. Dahl, a German engineer. The machine is equipped with simple and rapid adjustments for taking care of drills of all sizes, from  $\frac{1}{2}$  to  $3\frac{1}{2}$  in. in diameter. No special skill is necessary on the part of the operator to grind a drill to the true angle required. The drill is ground while it is being continuously revolved, and the grinding wheel is successively positioned at various angles with respect to the axis of the drill to produce the backing off of the cutting edges. No centering of the drill is required. The drills are pointed after grinding without being removed from the machine.

Features in its design enable the machine to insure

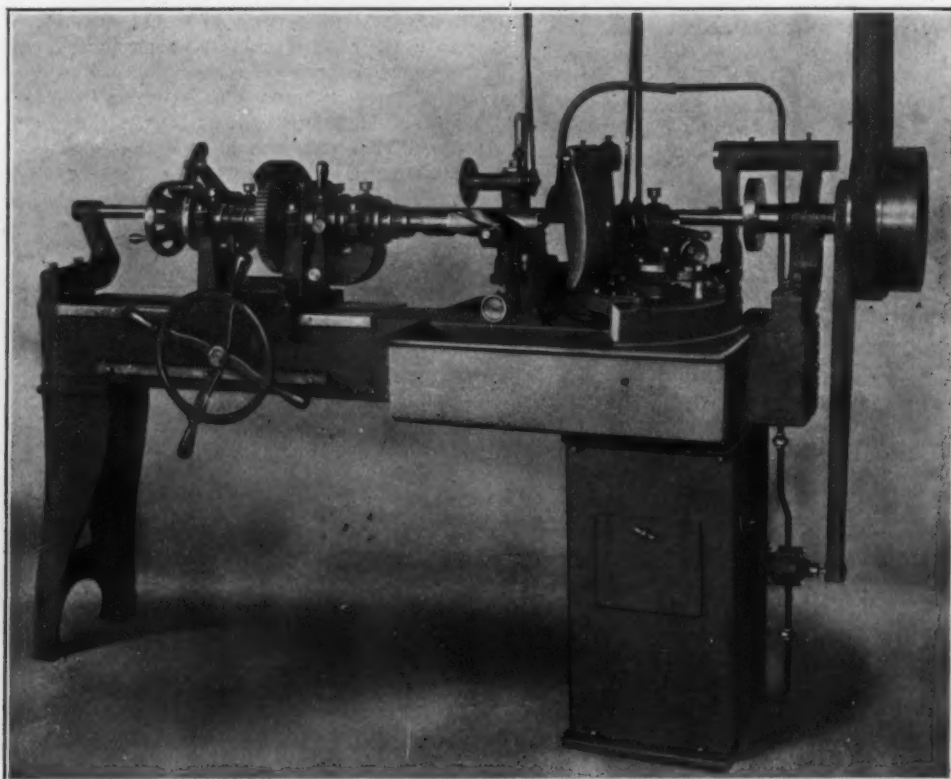


Fig. 1.—The Dahl Automatic Drill Grinder, Built by Manning, Maxwell & Moore, New York City.

of tunnel has been opened and lined in that time and without passing a yard of mud through the shaft.

#### **Tunnels Meet with Mathematical Precision.**

The accuracy with which the shoes of the two shields met near the middle of the Hudson on the Pennsylvania tunnels is shown in Fig. 18. By examining the lines of rivets it will be seen that both tunnels were in line, both vertically and horizontally. The joint was absolutely perfect.

A Glasgow news dispatch dated January 3 notes the suspension of Neilson Brothers & Co., iron and steel merchants. The trouble was due to the firm's inability to deliver steel plates sold for forward delivery and to other speculation in the iron and steel markets.

Eastern railroads are contemplating the purchase of a large number of steel cars. Only a short time ago the Pennsylvania Railroad announced its intention of spending a large sum of money for this class of rolling stock, and the Erie Railroad has under consideration the purchase of 3000 steel cars, which will cost approximately \$3,600,000.

an equal height and even cutting on the lips of the drill. The wear on the face of the emery wheel is uniform, therefore no equalizing of the wheel is required. On the head of the machine are provided gauges for adjusting the wheel for various diameters of drills, and there is also a micrometer adjustment for adjusting the wheels to cover allowance for wear.

The operation of the machine may be understood from the line drawings, which show an original design of the machine that has since been modified in some particulars, as may be noticed in the half-tone engraving, Fig. 1. On the bed of the machine there is mounted the spindle stock *a*, which may be traveled by a pinion, *b*, meshing in a rack on the bed. The spindle *c* has a clamping socket, *d*, for receiving the shank of the drill, the drill being centered at its forward end in a collar plate (a V-shaped trough takes the place of the collar plate in the latest design). The spindle is driven by gears from a back shaft on which the driving pulley is mounted. By means of an eccentric, *e*, on the drill spindle, an oscillating motion is imparted through a rocking sleeve on the back shaft to a ratchet and pawl mechanism, *f*. This causes the drill to be slowly moved by the screw *i* in an axial direction toward the grinding wheel *h*. The latter is driven by a round belt and is mounted on

a support, the base plate *p* of which is rotatable around the vertical pivot *i*, while the plate *j*, carrying the bearing of the shaft of the grinding wheel, is rotatable around the pivot *k*. This latter plate is connected through a link to a bell crank lever, *l*, pivoted in a stationary support, which is in operative engagement with a cam, *m*, mounted on the back shaft. This is clearly brought out in the end elevation. The movement of the plate *j* is limited by stops *n* and *o*.

In operating the machine the drill, after being positioned in the clamp and V trough, is advanced against the grinding wheel at the moment when the latter is in

of the operation the drill has been rotated 90 degrees, the cam 180 degrees and the bell crank lever *l* has assumed the position indicated in the end elevation in Fig. 2. The pin on this lever now engages the concentric part of the cam *m*, so that no movement of the bell crank lever or the link takes place during the next half rotation of the cam. During the quarter turn of the drill corresponding thereto the end presented to the grinding wheel passes over one helical groove, but shortly before entering this phase the corresponding part of the cam preceding the concentric part turns the support around again and brings it to the position shown in Fig. 3. The position shown

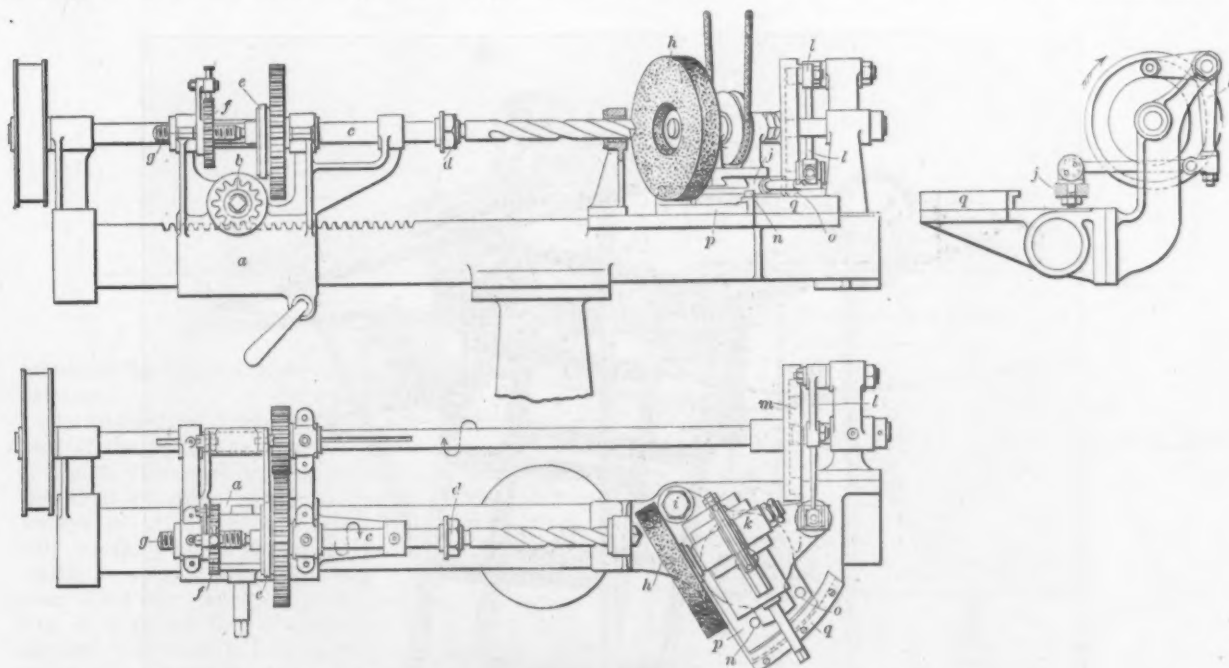


Fig. 2.—Front and End Elevations and Plan of the Dahl Automatic Drill Grinder.

a position shown in Fig. 3. Before starting, the machine is adjusted to bring the wheel to this position. For the grinding of an ordinary double threaded drill the gears between the spindle and the back shaft are in the ratio of 2 to 1; in the case of a triple threaded drill the ratio would be 3 to 1, and so on. When the machine is set in motion the cam *m*, one-half of which is concentric with its axis, is in such a position that the grinding wheel first passes from the position shown in Fig. 3 to that in Fig. 4; that is, it is pressed against the drill, and the latter through the ratchet mechanism *f* is gradually moved against the wheel. At this point the cam produces only rotation of the upper supporting plate *j* around the pivot *k*, which rotation continues until the plate strikes against the stop *o*. During this time the drill has rotated

in Fig. 5 is maintained only for a very short period. During the next half revolution of the drill the cam makes a complete revolution and the movements of the support are repeated, so that now the other half of the drill point is treated.

The sharpening of the point is not completed after one revolution of the drill, a number of revolutions being necessary while the drill is gradually moved against the grinding disk. The drills are pointed after being ground without being removed from the machine by the small thin grinding wheel independently driven from the countershaft and mounted in a swiveling adjustable bracket just back of the drill, as seen in Fig. 1.

The machine weighs approximately 1900 lb. It is furnished with one large emery wheel, one small wheel for

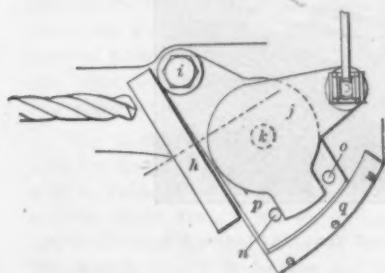


Fig. 3.

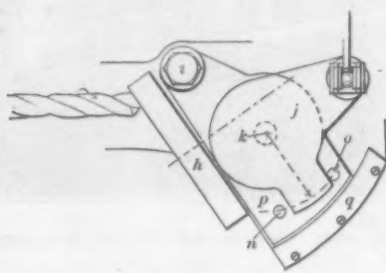


Fig. 4.

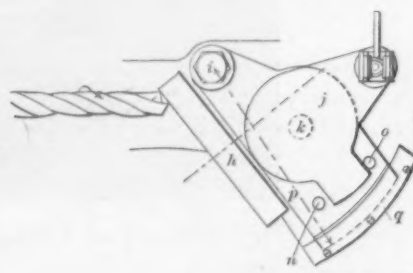


Fig. 5.

Plan Views of the Grinding Head at Progressive Stages in the Sharpening of a Drill.

so far that one-half of the conical surface between the two helical grooves has been treated.

When the base plate *j* strikes against the pin *o* the plate *p* begins to turn around the pivot *i*, which rotary movement did not previously take place because the plate *j* turns much more readily than the plate *p*, the latter being subject to considerable friction in its bearing in the guide *g*. The rotation about the pivot *i* causes the grinding wheel to be presented at a different angle against the drill, which produces the backing off or beveling of the cutting edge of the drill. From the beginning

pointing, the necessary rests for the end of the drill and bushings for the taper shank. A wide range of automatic feed is provided. With each machine are furnished countershaft, water attachment and the necessary wrenches.

Owing to the difficulty in obtaining tar and pitch of a uniform consistency, tar macadam pavements have given rather unsatisfactory service in Toronto, Ont. According to City Engineer C. H. Rust, the use of this kind of pavement may have to be discontinued.



## The Gravity Molding Machine.

A molding machine of an entirely new type, which accomplishes the ramming of the mold by gravity, is being built by the Mitchell-Parks Mfg. Company, St. Louis, Mo., and is shown in the accompanying illustrations. The gravity ramming is accomplished by compacting the sand into wedge shapes to prevent disintegration while falling, and then dropping them into the flask from a height of 12 to 15 ft., which causes the sand to be packed by the impact of its fall.

The machine, shown in Fig. 1, takes the sand from a

and lowered. The bottom of the cradle, on which the molds are made, is supported in bearings for the purpose of turning the flasks when filled. A strike-off is suspended over the flask and is used to remove the surplus sand, which falls through the riddle back into the hopper under the floor.

For placing the empty flasks on the cradle, and for removing the finished molds, the use of two jib cranes, as shown in Fig. 2, is recommended, one on each side of the machine and each of sufficient sweep to cover floor space enough to hold the molds for a day's run. To secure the best results the sand should be tempered at

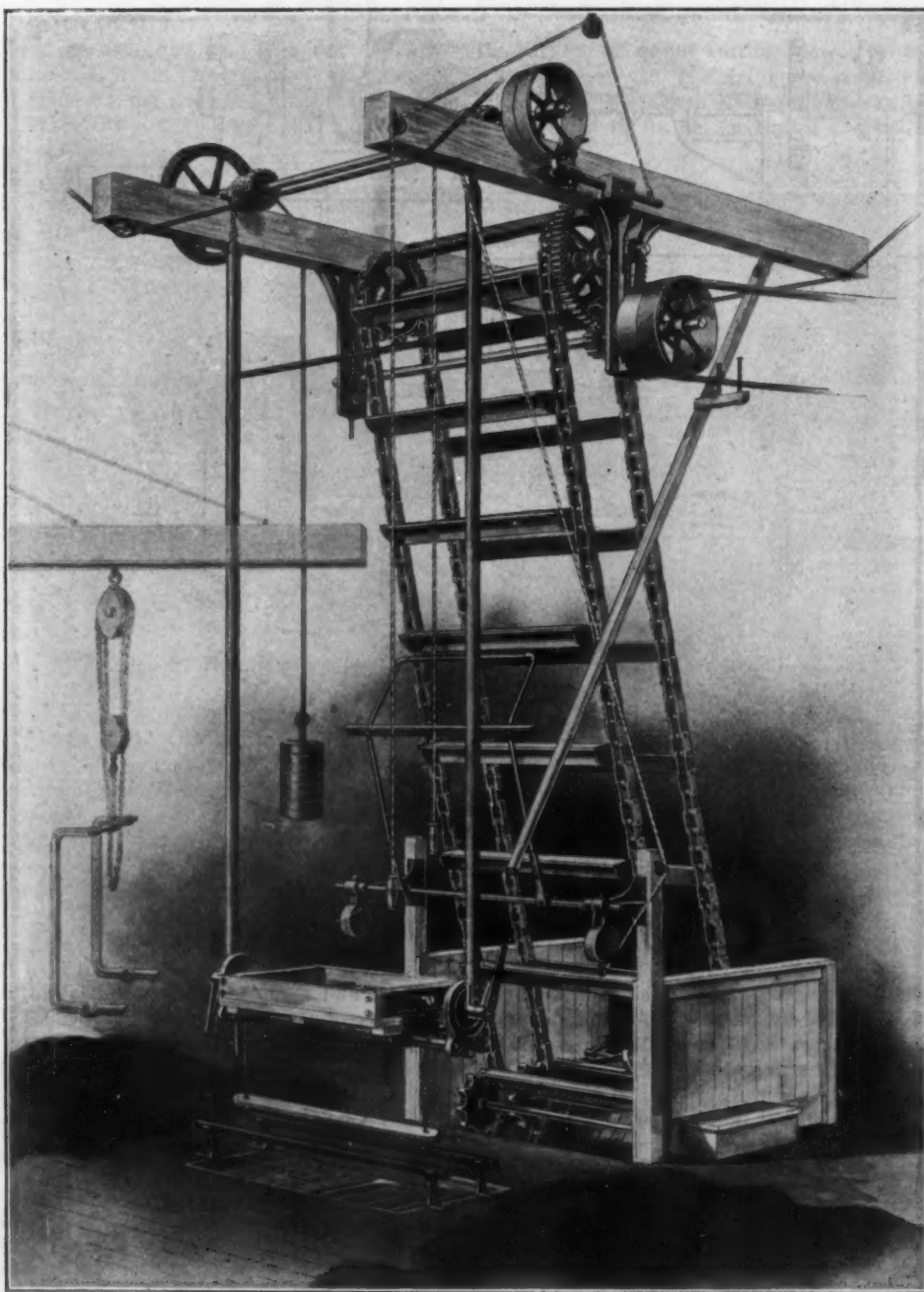


Fig. 1.—The Gravity Molding Machine, Made by the Mitchell-Parks Mfg. Company, St. Louis, Mo.

hopper below the floor level, which is provided with an automatic riddle on a level with the floor, and a roller feeder conveys the sand in a uniform stream to the elevator. The latter consists of two endless chains carried on sprocket wheels, and is equipped with 4-in. angle iron buckets, which are set 2 ft. apart and are secured at either end to the chains. The buckets vary in length, according to the size of the machine, and are 2 ft., 4 ft. and 6 ft. long for the Nos. 1, 2 and 3 machines, respectively.

The shafting supporting the top of the elevator is attached to two timbers 15 ft. above the floor. Suspended from these timbers and hanging directly in front of the elevator is a swinging cradle, which not only can be moved to and from the elevator, but can also be raised

and arranged in heaps on either side of the machine. Two laborers are required to operate the cranes for bringing the flasks to the machine and removing the finished molds, while one molder only is required to operate the machine.

As shown in the side elevation, Fig. 3, the sand after passing through the automatic riddle *a* into the hoppers *b* is fed by the roller *c* to the buckets *d* of the conveyor, and in its upward movement comes in contact with rammer *e*, and is then carried to the top of the elevator, where it is discharged into the flask. The rammer, which is automatic in its operation, falls from one bucket full of sand to another as each is brought in contact with it, and the force with which it compresses the sand can be



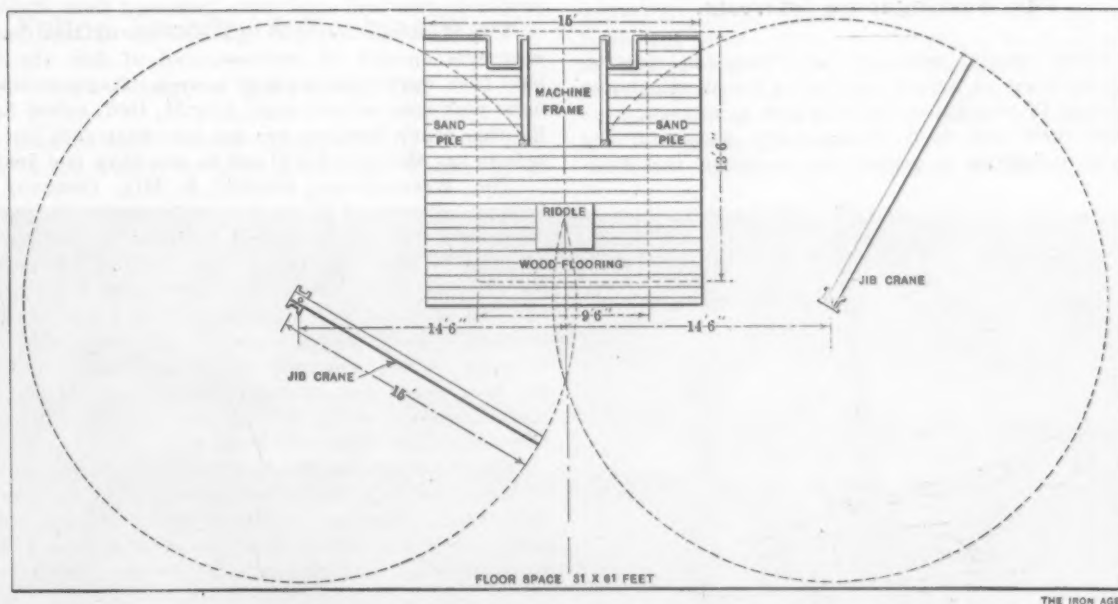


Fig. 2.—Plan View, Showing Location of Jib Cranes for Handling Molds and Flasks.

regulated by increasing or decreasing the weight of the rammer.

In making the mold, a match board to which the lower half of the pattern is attached is clamped to the cradle *f*, Fig. 3. The flask is then set on the match board and the sand conveyor is set in motion. The compressed wedges of sand are then discharged into the flask its full width, and to secure a uniform distribution the cradle is swung back and forth. When the flask has been filled the conveyor is stopped and the strike-off, Fig. 4, is swung into position and the surplus sand removed. The flask is then fastened to the cradle by another clamp *g*, rolled over, and by the release of a brake on the shaft, from which the swinging cradle is suspended, the cradle and flask are allowed to descend until the flask rests upon the supporting bars *h*, Fig. 5. The clamp which holds the flask to the cradle is then released, and by releasing the brake the cradle ascends to its normal position, carrying with it the match board and pattern, the drawing of the latter from the mold being accomplished in this way, as shown in Fig. 6.

For making the cope the match board of the drag is removed from the cradle and another match board with the cope half of the pattern fastened to it is placed into position, and the mold is made in the same way as for the drag. For removing the cope flasks special balls are used on the cranes, as shown in Fig. 1, which allow the flask to be turned and placed in position on top of the drag. Bottom boards are clamped on the drags before they are turned in the cradle and are carried away from the machine with the flask for the purpose of supporting the sand. The cope flasks are provided with special bars, which hold the sand without bottom boards.

The sand wedges drop from the buckets into the flask at the rate of over 50 a minute, and a flask of a large size can be filled in a very short time. No stripping plates are required, and as the patterns are placed on the match board in halves the machine can be rapidly changed from one style pattern to another.

Harbor improvements at Fishguard, on the Welsh coast, have recently been completed by the Great Western Railway. To American engineers accustomed to public harbor improvement work this large private undertaking seems unusual. Over 2,000,000 tons of rock have been moved, a commodious railroad station, electric cranes, power house and marine depot and 6 miles of sidings have been built, together with powerful breakwaters and sea wall galleries for landing cattle. The new harbor is surrounded on three sides by high hills, two bold headlands 6 miles apart marking the entrance to the bay. It is expected to make the place a port of call for steamers

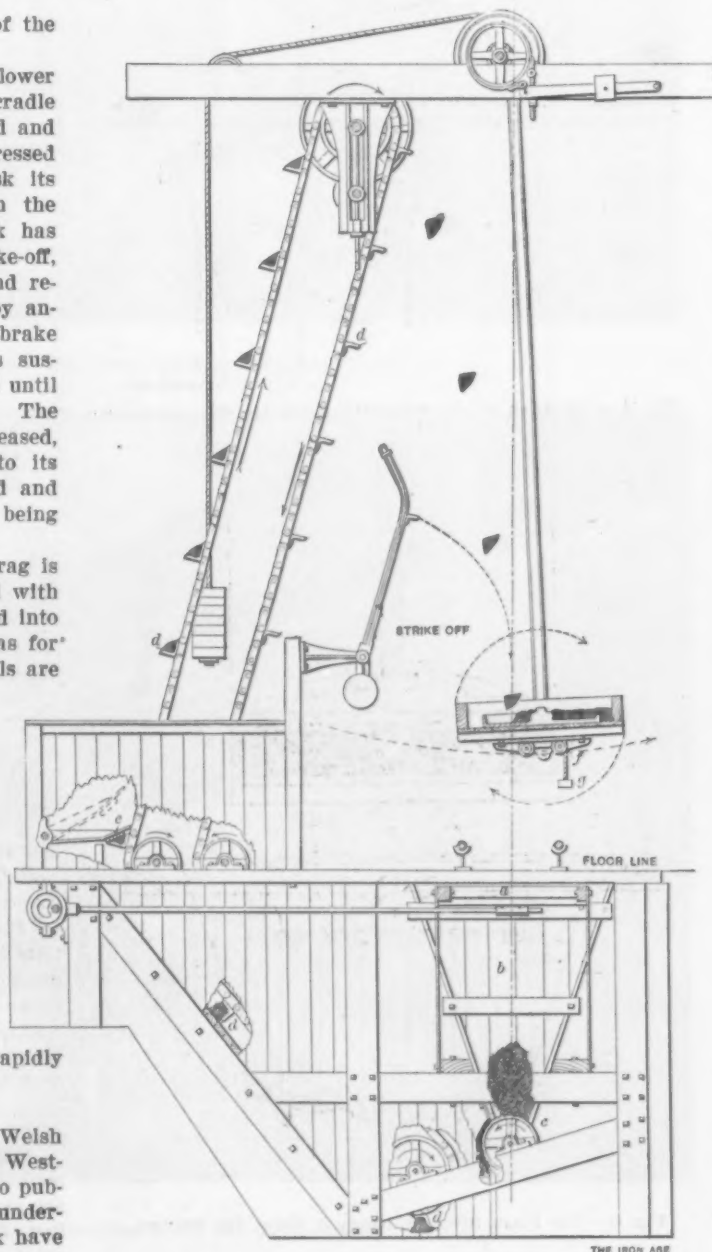


Fig. 3.—Side Elevation of the Gravity Molding Machine.

bound for Glasgow and Liverpool from Canada, the United States, Australasia and Eastern ports, as well as providing a quick route from London to Ireland.

### The Westinghouse Interests.

A recent special issue of the *Pittsburgh Gazette-Times* contained an article relating to the Westinghouse interests at Pittsburgh, which is in part as follows:

While 1906 has been phenomenally successful for American industries in general the record of the West-

profitable year and some have increased their dividends.

The Westinghouse Air Brake Company has done an enormous amount of business, and of late the shops have been working seven days a week. As the company's fiscal year does not end until July 31, 1907, actual figures for this year's business are not yet obtainable, but it is safe to say the record will not be less than last year's.

The Westinghouse Electric & Mfg. Company has broken all records in its history in orders, output and shipments, and the estimated business for the year of \$40,000,000 has been more than realized. Repeatedly the capacity of the factory has been taxed to its utmost, but the splendid organization of the army of 12,000 workers always proved equal to the emergency. The company is now engaged in adding more facilities to the floor space and operating area. Judging from all present indications the coming year will show a further increase in the company's business.

The Westinghouse Machine Company is now doing a business that indicates double the output of the previous fiscal year. Increased facilities have not been able to keep abreast with the demand for Westinghouse-Parsons steam turbines, and although the factory turned out in

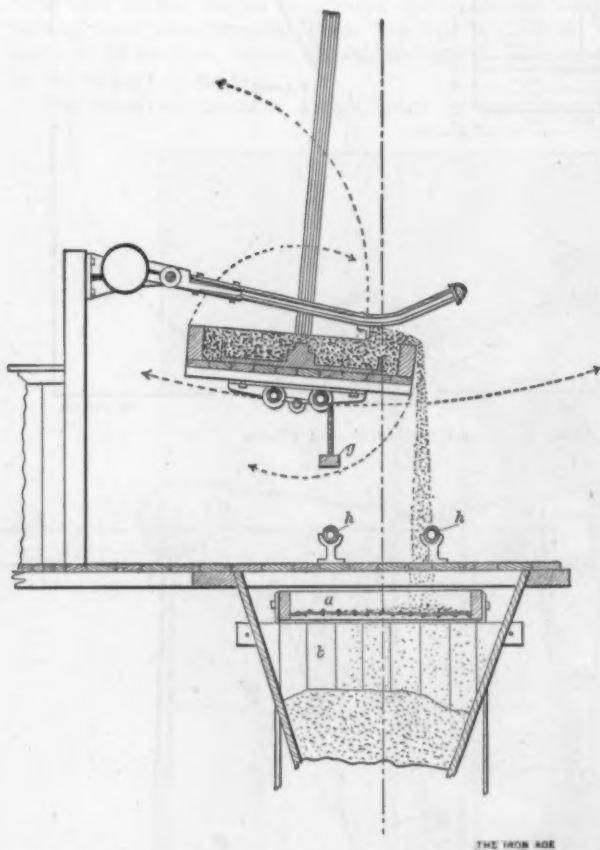


Fig. 4.—Operation of the Strike-Off Removing Surplus Sand.

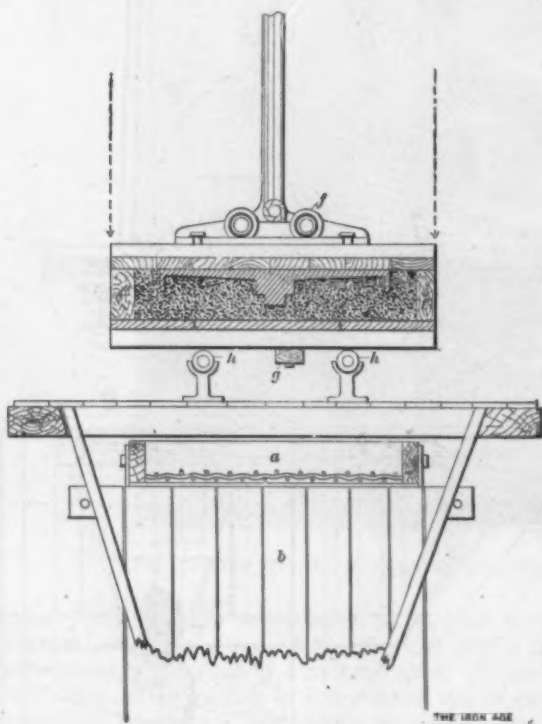


Fig. 5.—The Flask Inverted, Ready to Draw the Pattern.

inghouse interests illustrates this in a remarkable degree. Not only have all the companies controlled by Mr. Westinghouse done more than their share of business, but most of them have achieved unprecedented records, in some cases doubling their previous high water mark of orders, production and shipments. All have had a

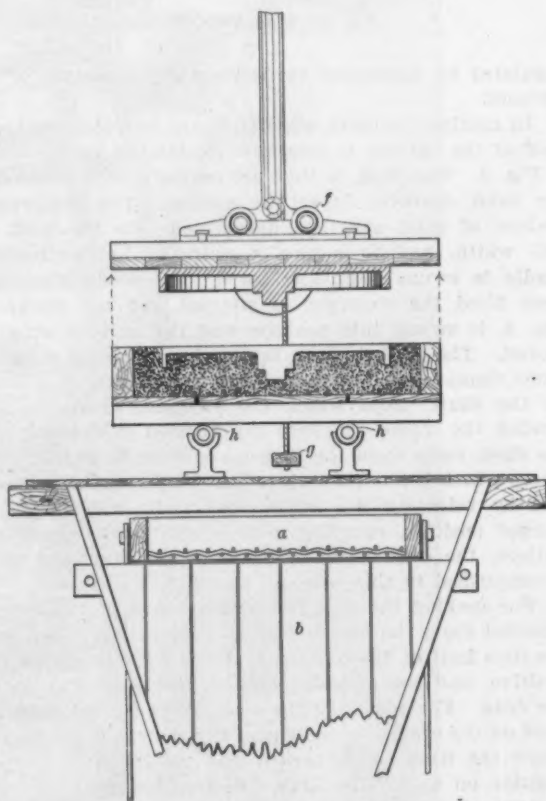


Fig. 6.—The Pattern Withdrawn.

less than 10 years almost 1000 units, aggregating about 1,500,000 hp., hundreds of these machines are now under construction.

The Union Switch & Signal Company is usually mentioned last. Its record for 1906, however, gives it the distinction of having done a business during that period comparatively larger than any of the group. While the company's business for 1905 was \$2,500,000, the present year has already reached twice that figure, and it will be higher before the end of the fiscal year.

William Blackmore and Alfred Howard, London, England, have obtained patents in the United States which are assigned to the T. R. Refractory Ore Syndicate, Limited, London, England, covering a process for the treatment of pyritic ores for the recovery of metals contained therein. It consists in roasting the pulverized ore at a temperature of about 800 degrees F., in the presence of air and steam, so as to convert the sulphide of iron into basic sulphate; in leaching the ore in acid liquors to dissolve the iron sulphate and in separating the solution from the solid residue containing the metals.

## The Fulton Foundry & Machine Works.

### New Plant at Kirkwood, Ga.

It may be said without exaggeration that the new shops of the Fulton Foundry & Machine Works, Kirk-

wood, Ga., typify all that is modern in construction and equipment of a plant of its character. These works have been owned and operated since 1904 by the N. P. Pratt Laboratory, Atlanta, Ga., an engineering and contracting company, making a specialty of equipment for fertilizer factories, sulphuric acid plants, brick yards, quarries,

mines, &c. Until recently the factory has been in Atlanta, but increased business prompted the management to erect an entirely new plant at Kirkwood, about 4 miles from that city, the site chosen being located on the suburban lines of the Georgia Railroad and reached as well by the city car line.

Before undertaking the design of the new works



Fig. 1.—View in the Foundry.—The Fulton Foundry & Machine Works.



Fig. 2.—View in the Machine Shop, Showing One of the Group Drives.

wood, Ga., typify all that is modern in construction and equipment of a plant of its character. These works have been owned and operated since 1904 by the N. P. Pratt Laboratory, Atlanta, Ga., an engineering and contracting company, making a specialty of equipment for fertilizer factories, sulphuric acid plants, brick yards, quarries,

George L. Pratt, engineer of the company, made a careful study of the factories of other machine tool builders, and the result has been the evolution of a plant that may safely be regarded as a model in the light of experience to date. A particular feature is the full advantage which has been taken of the flexibility of electric drive, which



allows most readily for future extension with the growth of business. Provision has been made to extend the buildings to twice their present size when circumstances warrant it.

The buildings are of steel and brick, the construction being entirely fireproof. Natural and artificial lighting are well provided for, the first from large and numerous windows and skylights, affording overhead lighting. The latter are located at the point where the roof of the main bay drops to the side bays, and are set at an

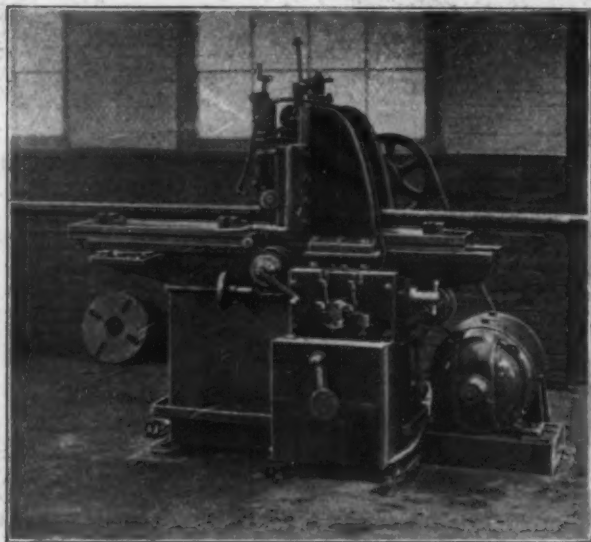


Fig. 3.—A Key Seat Milling Machine, Motor Driven.

angle of about 30 degrees with the vertical. This arrangement has the advantage of avoiding shadows between the main and side bays and tends to give a better diffusion of light. The skylights are in two sections, the upper portion being stationary, while the lower swings from the upper side for ventilating. Ventilators are also placed in the roofs over the main bays. The foundry, Fig. 1, and machine shop, Fig. 2, are in separate buildings, which are practically duplicates, the only dif-

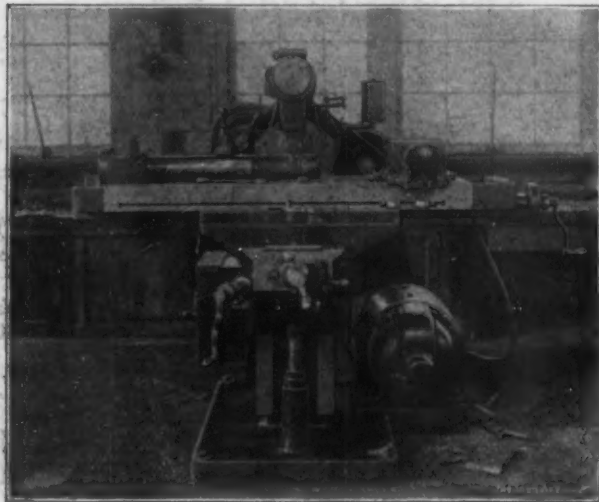


Fig. 4.—A Milling Machine Chain-Connected to Its Motor.

ference being that the foundry is arranged to include a cupola room.

The old plant was operated by belt drive, and there were a number of old machines which could not well be discarded. This consideration, as well as that of future extension already referred to, and the desire to cheapen the cost and accelerate the production of work by the use of machine tool units, were the main factors in the decision to adopt electric drive. The general rule has been group driving for the smaller tools and individual drive for those of larger capacity, to make their operation independent of that of other machinery.

The power house is located about 100 yd. from the

foundry building. In the boiler room there are two 75-hp. boilers set in steel casings. Natural draft is provided by a radial brick chimney 120 ft. high, with a 36-in. flue. Three steam pumps are installed, one supplying water to a standpipe 130 ft. high and the remaining two feeding the boilers. In the engine room there are two General Electric direct current generators, each having a capacity of 50 kw. at 250 volts when running at 280 rev. per min., direct connected to Harrisburg slide crank engines. The current is distributed to the factory from a main switchboard. In the generating room there is also located an air compressor for operating the pneumatic tools throughout the shops and for driving an air lift, which pumps water from an artesian well. The engine room is served by a small 4-ton crane.

From the power house the conducting cables are laid in ducts to the main buildings. These are of concrete, 36 in. wide and 42 in. high, and carry the steam and air pipes, as well as the electric cables. For ventilating the ducts there are chimneys, which pass up through the front wall of the machine shop, and even on the hottest

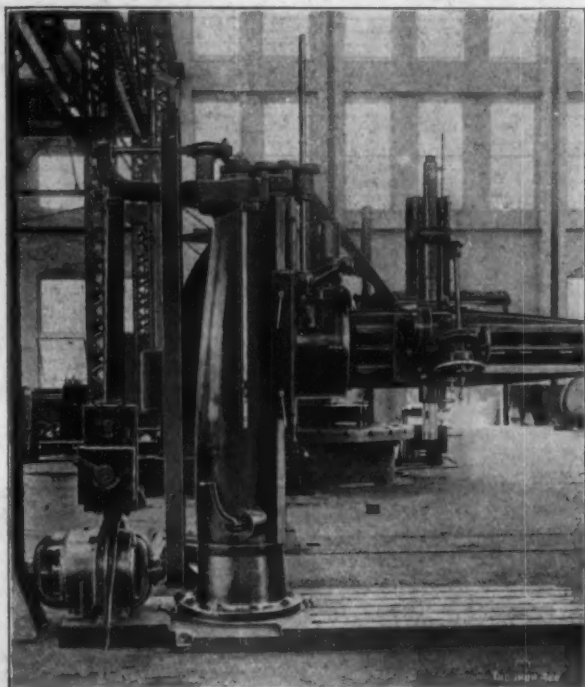


Fig. 5.—A Motor Driven 5-ft. Fostick Radial Drill.

summer days no trouble has been experienced by overheated air in the conduits. The main conduits pass under the floor of the machine shop, there dividing into two branches running the length of the building, from which the air, steam and electric connections are made. The wiring to the various motors is also carried under the floor in ducts, these being located about the middle of the side bays, conveniently accessible to the motors in these bays.

The floor of the machine shop rests on a 4-in. bed of concrete on a solid clay foundation, and consists of 2 x 4 in. pine blocks, sawed 4 in. long and set on edge. The blocks are laid in a coal tar mixture and the cracks are filled with the same preparation. All of the heavier machines have their special foundations. The light machines are placed directly on the floor and are anchored down by expansion bolts. The removal of a row of these pine blocks allows the running of the leads to any motor from the nearest duct, where a hole is drilled through the roof of the duct. A conduit is then laid from the opening in the duct to the motor and the blocks removed are grooved to allow them to return to their original position. The scheme has the advantage of resulting in a neat job and allowing the location of machines as convenience may require without respect to the position of the conduits. Outlet boxes are located at convenient points about the shop, so that portable tools and lights can be quickly connected.

The accompanying illustrations bring out the advantages of electric drive as applied to the machine tools. All of this equipment was furnished by the General Electric Company. In the shops there are 29 stationary motors, of both variable and constant speed types, aggregating a total of 203 hp. Fig. 2 is a general view in one of the bays in the machine shop, showing an example of the group driving of machine tools.

In the pattern shop an unusually good lighting is possible because overhead belts are eliminated. Here are to be found a number of interesting driving arrangements. A Whitney single surface planer is driven by a 5-hp. motor suspended from timber straps beneath the floor, and at the commutator end the shaft is extended and fitted with an outboard bearing and extra pulley. By this arrangement the motor takes the place of the countershafting and is belted upward direct to the planer head. An Oliver 38-in. band saw is geared to a 5-hp. motor, and like all of the other individually driven tools is controlled from a starting rheostat mounted in an asbestos lined cabinet to reduce fire risk. For a similar reason all of the motors are totally inclosed. Other tools in the pattern shop include an Oliver univer-

examples of the individual drive of machine tools, the first being that of a key seating milling machine. The motor, a 3-hp. variable speed machine, and the controller, are both totally inclosed. Fig. 4 shows a 5-hp. variable speed motor connected to a miller by chain drive, and Fig. 5 a neat application of motor drive to a 5-ft. Fostick radial drill, the 5-hp. variable speed motor being mounted on an extension of the drill press base.

A typical lathe drive is shown in Fig. 6. In this case, as in all others, the motor is mounted on the headstock. The controller is at the tailstock end of the lathe, being operated by a chain drive from a splined shaft, allowing the controlling handle to travel with the lathe carriage. In some instances the controllers are placed behind the headstock, with the controller handle at the lathe apron.

Materials are transported by cranes, hoists and industrial car tracks. The main bays of the machine shop and foundry are served by 20-ton electric cranes, while the side bays are equipped with 4-ton cranes having electric hoists and hand operated travel. Industrial car tracks run throughout the plant and are in general so located as to facilitate the transfer of material from

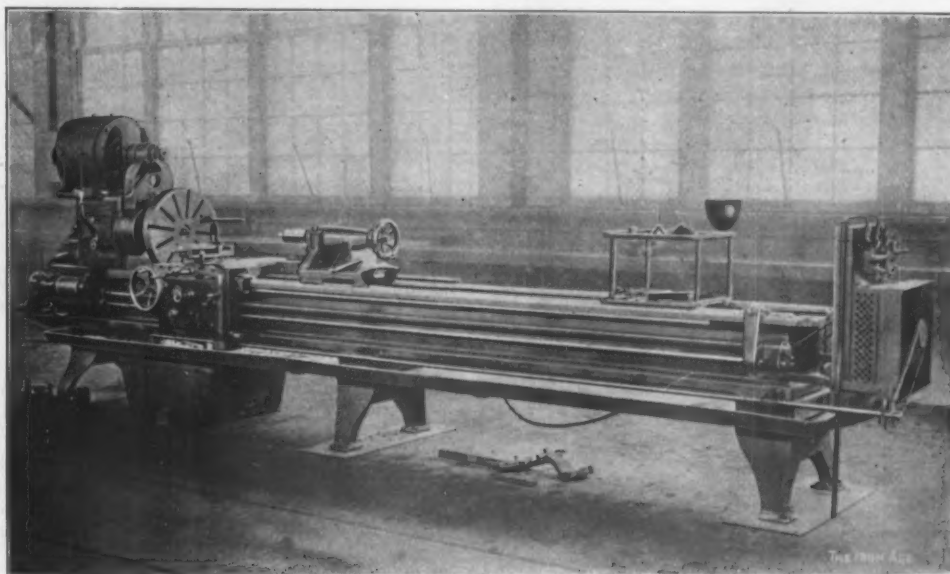


Fig. 6.—A Motor Driven Lodge & Shipley Lathe Controlled from the Apron.

sal saw bench, driven by a 5-hp. motor; a universal woodworker, with a motor of the same size, and an Oliver 38-in. pattern makers' lathe, driven by a 5-hp. variable speed motor. In the basement below the pattern shop a 5-hp. constant speed motor is installed for driving a cut off saw, a band saw and a grindstone.

Both the forge shop and cleaning room are electrically operated, a 15-hp. motor being used for a bolt header and two blowers, and a 5-hp. motor for the tumblers. There are also two motor driven emery grinders in the cleaning room. The steam hammer in the forge shop is supplied from mains which furnish steam to the heating system and to an engine for the cupola blowers.

It is in the machine shop that advantage has been taken of the group method of driving the older belt driven machines. One such group is to be found at one side of one of the bays, where power is supplied by a 20-hp. motor mounted on the wall. A similar arrangement on the opposite side of the same bay cares for another group of tools. The tool room is equipped with two motor driven emery grinders.

The main bay of the machine shop is devoted to erecting and contains several portable tool units. The largest machine tool in the plant is a 16-ft. Betts boring mill, operated by a 15-hp. variable speed motor. The rails of this machine are driven by a separate 5-hp. motor. The arrangement of this tool is specially interesting in showing how the controller, which is mounted on a portable stand, may be placed wherever most convenient to the operator. Figs. 3, 4, 5 and 6 show other representative

freight cars to machines with as little handling as possible. A side track from the Georgia Railroad passes through the front of the machine shop and foundry, so that loading and unloading can be done with the cranes.

The artificial illumination of the shops has been equally as well cared for as the natural lighting already referred to. Eighteen G. E. 5 ampere 110 volt multiple arc lamps, arranged two in series, with inverted concentric diffusers, are used for lighting the machine shop. The foundry is lighted by 14 similar lamps, and the remaining smaller buildings are lighted in the same way. All of the lighting wiring is carried in iron armored conduits.

In addition to the thoroughly modern electrical and mechanical equipment of the shops an ample water system is installed for fire protection and sanitary purposes. Attention has already been called to the pumping equipment for water supply to a large standpipe, from which the supply is delivered under a constant head. Individual iron lockers are provided for the workmen, and hot and cold shower baths are fitted up in the wash-rooms of the machine shop and foundry.

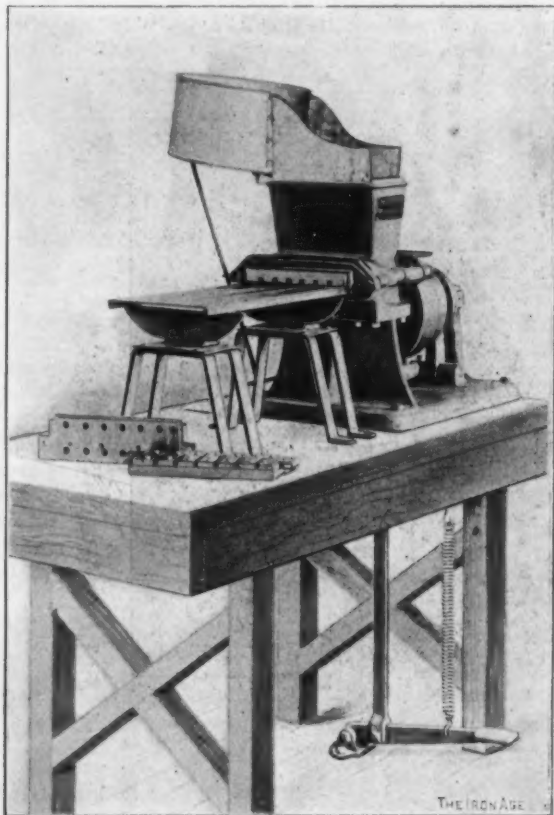
As a result of practical tests looking to the electrification of the Swedish railroad system the Government is building at the Falls of Gullspang a large electrical station, capable of producing 150,000 hp. The step is expected to result in reducing by 1,500,000 kroner annually the consumption of British and other coal.



### The Wadsworth Multiple Core Machine.

Six cores at a time may be made with the Wadsworth multiple spindle core forming machine, and these are guaranteed not to vary more than 1-1000 in., under or over the sizes specified. The dies are built up from steel plates, all hardened and ground to size, and are so constructed that after they become worn they can be restored to their original sizes by regrinding. The screw conveyors for ejecting the material from the hopper through the dies are tool steel, also hardened, and are contained in a steel holder. The small point at the end of each screw which enters into the mouth of the corresponding die to form the hole through the completed core, is not in one piece with the screw but is separate, being held by a small chuck formed on the shank of the screw. Therefore when the point becomes worn out an entire new screw is not required, merely a small point which is inexpensive.

Another and greater improvement embodied in this



The Wadsworth Multiple Core Machine, Built by the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio.

machine is a cone clutch which allows instantly engaging the drive for the screws by depressing a foot pedal placed under and directly in front of the machine. The minute the foot is taken off a friction plate on the opposite side of the cone which engages with a stationary plate connected with the backgearing of the machine instantly stops the machine. This obviates the soft and hard places such as are usually found in cores made by power driven core making machines, where the machine is not stopped instantly when the feeding of the sand is stopped.

The core trays as furnished with this machine have 24 longitudinal grooves milled in them, with a distance between their centers equal to one-quarter the distance between the centers of the dies, and by making four moves of the plate the six cores made at each operation can be deposited in parallel rows and 24 cores accommodated on a single plate. While this machine is shown fitted with square dies, round dies can also be furnished, and core trays to suit where large amounts of cores are used and accurate cores must be obtained. There seems to be no doubt that the multiple-spindle core making machine will show a great advantage over the single-spindle machine as now commonly used. The machine is manufactured by the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, which makes a specialty of core making machinery.

### Uehling Pyrometer Improvement.

#### Development of a Multiple Recording Pneumatic Pyrometer.

Probably over three-quarters of all the blast furnaces in the United States are equipped with pneumatic pyrometers, this form having become a standard because of its accuracy, reliability and durability. In some in-

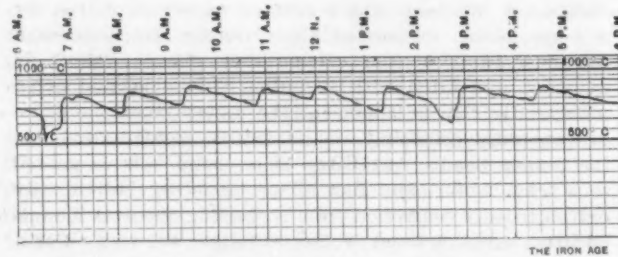


Fig. 1.—Hot Blast Temperature Record—Stoves in Good Condition.

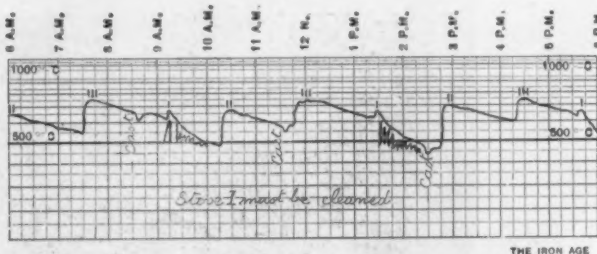


Fig. 2.—Hot Blast Temperature Record—No. 1 Stove in Bad Condition.

stances its popularity is even more due to its making an exact and continuous autographic record of the temperature measured, which is of so much importance in all operations where heat is a controlling factor. It shows the superintendent what changes of temperature, if any, have taken place, from which he can tell whether his instruc-

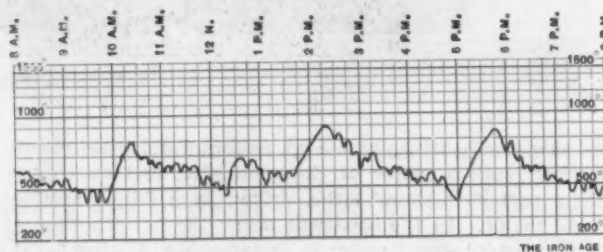


Fig. 3.—Gas Temperature Record—Hand Charged Furnace.

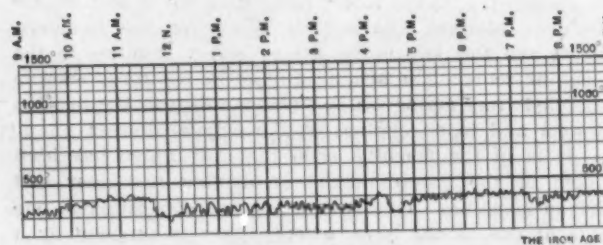


Fig. 4.—Gas Temperature Record—Automatically Charged Furnace.

tions have been followed, and often is a means to an understanding of conditions that might otherwise be baffling.

The double instrument is the one in general use for blast furnaces, indicating and recording the temperature of both blast and gas. These records give valuable information to the superintendent or manager, the blast record showing the temperature of the air entering the furnace, whether the stoves were changed at proper intervals, how each individual stove held its heat, its initial and final



temperature while on blast, &c., as well as every stop, when it occurred and its duration, and last but not least, the record reveals the exact condition of each stove.

Figs. 1 and 2 are typical hot blast temperature records from an Austrian furnace and are in the Centigrade scale ( $1^{\circ}\text{C.} = 1.8^{\circ}\text{F.}$ ). Fig. 1 shows the stoves in good condition; it also shows that the blast was taken off at 6.30 a.m. and remained off about 22 min., and that there was a similar stop between 2.15 and 2.45 p.m. Fig. 2 at a glance reveals the fact that No. 1 stove is in bad order, and that it should be taken off for cleaning and repairs. Short intervals of stops are shown between 8.30 and 8.45 and between 11.30 and 11.45 a.m. Figs. 3 and 4 are gas temperature records from two American furnaces selected because of their radical difference. Fig. 3 is characteristic of a hand filled furnace and is a bad example, while Fig. 4 is a very good example of automatic charg-

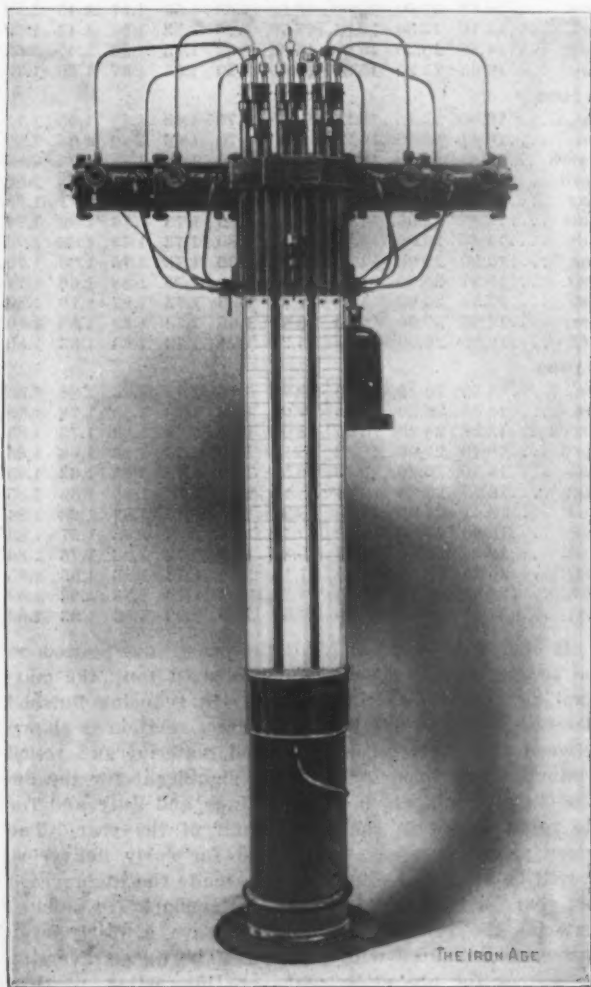


Fig. 5.—An Eight-Unit Recording Pneumatic Pyrometer Made by the Uehling Instrument Company, Passaic, N. J.

ing. The record in both cases indicates every charge going into the furnace and is therefore a perfect check on the stockhouse men.

Every blast furnace man knows that the top temperature rises as the stock is permitted to get low in the furnace, and that high top temperatures mean waste of fuel. Irregular charging is conducive to hot tops, hence waste of fuel. Temperature curve, Fig. 3, shows that the stockhouse men indulged in frequent intervals of rest of considerable duration, whereas Fig. 4 shows a regular and continuous filling operation. Largely, if not entirely, in consequence of regular charging, the top temperature of the latter furnace does not average much over 350 degrees, while the furnace giving the record shown in Fig. 3 had an average top temperature of fully 600 degrees. The fuel consumption of these two furnaces was respectively 1950 and 2400 lb. of coke per ton of pig iron produced, which demonstrates the effect of top temperature on fuel economy.

The control of the top temperature is, therefore, a most important factor in the fuel economy of a blast fur-

nace, and the knowledge of its temperature is quite as important, if not more so, than that of the blast temperature; but since there can be no comprehensive knowledge of either without an autographic recording pyrometer, all blast furnace managers who have given the subject sufficient study and consideration deem the autographic record most essential, and that is the reason the pneumatic pyrometer has found such favor, and in spite of its high first cost has been installed at practically all the modern furnaces and many of the smaller and older furnaces, where progressive managers are in charge.

What is true of its application to the blast furnace is true of an autographic recording pyrometer in every industry in which the quality of the product depends upon the proper control of the temperature involved in its production. Those who have studied the subject of annealing know that the best results are obtained between narrow limits of temperature and that every composition of metal has its own definite temperature range, which cannot be varied from without affecting the quality. As this becomes more and more generally appreciated the need of accurate and reliable means for controlling temperatures, not only in annealing, where the pneumatic pyrometer is already extensively used, but in all processes where heat plays an important part, is being more and more keenly felt, and it is in anticipation of this want that the Uehling Instrument Company, Passaic, N. J., has recently developed the pneumatic pyrometer into a multiple form, being now prepared to furnish them in systems of four, six, &c., up to 12 units. Fig. 5 shows a system of eight pyrometers, capable of indicating and recording simultaneously temperatures at eight different points which may be located 500 ft. apart, the main instrument and recorders being placed in some convenient central location.

A feature of great importance peculiar to the pneumatic pyrometer is that it will not only record the temperature at any convenient place, but can be so installed that it will at the same time indicate this temperature at any other place where such indication may be necessary or desirable. Thus, for instance, the furnace attendant may have the temperature indications of his furnace or furnaces within convenient view, while the same is simultaneously shown in the "shack" of the boss heater and the office of the superintendent, if the latter places are within reasonable distance from the furnace.

The records of the pneumatic pyrometer are traced on rectilinear charts, where the whole record can be seen at a glance. Two or more records can be very conveniently compared by placing one under the other, and what is fully as important, the records can be filed in book form for preservation and future reference.

The Uehling gas composimeter, which is based on the same principle as the pneumatic pyrometer, has now been perfected, so that it is quite as reliable as the latter. It not only continuously samples the gas and makes a continuous autographic record of the percentage of  $\text{CO}_2$  contained in it; but also continuously indicates the  $\text{CO}_2$  at any desired point; e. g., at the boiler front in view of the fireman, or on the charging platform of the gas producer, or at any convenient place about a blast furnace where most important information would be derived from an autographic record of the per cent. of  $\text{CO}_2$  contained in the waste gases. Records from both composimeters and pyrometers are of use where the performance of a boiler is being studied. For example: the percentage of  $\text{CO}_2$  in the products of combustion, the temperature of these products just before they enter the flues of the boiler (if it be of the return tubular type) and when they enter the chimney, all afford an accurate check on whether or not the boiler is being run at its best economy.

By the use of aluminum wire the natural oxide upon which forms an effective insulation for modern voltages, magnet windings of uninsulated wire are said to have proved feasible. Paper wound wet between the layers is effective for over 200 volts, and extra oxidization has been secured by dipping in a chemical bath for higher potentials.

## Fluctuations in the Prices of Iron and Steel Products, 1898-1906.

(With Supplement.)

The fluctuations in the prices of pig iron, steel billets and representative forms of finished iron and steel in 1906 are shown graphically on the accompanying chart. The price lines are plotted from monthly averages of the prices given week by week in the market reports of *The Iron Age*, and all the leading distributing centers are represented. The table below contains the monthly average prices on which the chart lines are based, these being for Bessemer pig iron at Pittsburgh, Southern No. 2 coke iron at Cincinnati, Local No. 2 foundry iron at Chicago, Bessemer steel billets at Pittsburgh, tank plates, refined bar iron and beams at Philadelphia, and cut nails and wire nails at Pittsburgh. The prices for pig iron and steel billets are in dollars per gross ton, while those for the various finished materials are in cents per pound:

Average Monthly Prices, 1898-1906.

Months.	Bessemer pig, Pittsburgh.	Steel billets, Pittsburgh.	No. 2 foundry, Cincinnati.	Local No. 2 foundry, Chicago.	Cut nails, Pittsburgh.	Tank plate, Philadelphia.	Beams, Phila- delphia.	Ref'd bar iron, Philadelphia.	Wire nails, Pittsburgh.
<b>1898</b>									
Jan. ....	9.87	14.93	9.50	11.00	1.10	1.10	1.30	1.11	1.42
Feb. ....	10.05	15.06	9.25	10.93	1.10	1.10	1.30	1.11	1.45
March ....	10.39	15.25	9.25	10.75	1.10	1.08	1.30	1.06	1.43
April ....	10.41	15.06	9.25	10.91	1.08	1.12	1.30	1.05	1.31
May ....	10.30	14.85	9.37	11.00	1.08	1.21	1.30	1.05	1.31
June ....	10.34	14.65	9.30	11.00	1.06	1.23	1.30	1.05	1.35
July ....	10.25	14.50	9.25	11.00	1.06	1.20	1.30	1.00	1.31
Aug. ....	10.35	15.85	9.37	11.00	1.05	1.23	1.37	1.06	1.26
Sept. ....	10.78	16.00	9.55	11.00	1.08	1.27	1.40	1.14	1.32
Oct. ....	10.36	15.56	9.75	11.00	1.10	1.27	1.38	1.13	1.33
Nov. ....	10.15	15.06	9.75	11.00	1.10	1.25	1.35	1.10	1.28
Dec. ....	10.58	15.80	9.90	11.00	1.10	1.26	1.35	1.11	1.27
<b>1899</b>									
Jan. ....	10.87	16.62	10.31	11.12	1.18	1.35	1.40	1.15	1.43
Feb. ....	11.00	18.00	11.69	12.12	1.32	1.55	1.42	1.20	1.57
March ....	14.50	24.30	13.75	14.60	1.48	1.89	1.55	1.41	1.94
April ....	15.03	25.37	14.50	15.12	1.67	2.18	1.64	1.50	2.05
May ....	16.20	26.75	14.56	15.37	1.65	2.23	1.63	1.56	2.10
June ....	18.51	30.10	16.00	17.60	1.97	2.48	1.82	1.81	2.30
July ....	20.65	33.12	17.56	18.87	2.12	2.58	2.08	2.00	2.42
Aug. ....	21.75	35.40	18.35	20.30	2.20	2.72	2.20	2.00	2.50
Sept. ....	23.43	38.37	19.94	21.87	2.45	2.92	2.40	2.05	2.76
Oct. ....	24.18	38.75	20.75	23.00	2.50	3.00	2.40	2.13	2.87
Nov. ....	24.78	36.50	20.75	23.10	2.48	2.87	2.40	2.21	2.95
Dec. ....	24.90	33.75	20.75	23.50	2.45	2.48	2.40	2.20	2.95
<b>1900</b>									
Jan. ....	24.90	34.50	20.69	23.50	2.50	2.38	2.40	2.20	3.20
Feb. ....	24.80	34.87	20.50	23.50	2.50	2.32	2.40	2.20	3.20
March ....	24.72	33.00	20.30	23.50	2.50	2.10	2.40	2.18	3.20
April ....	24.70	32.00	20.19	23.37	2.50	2.02	2.40	2.12	2.95
May ....	21.00	28.90	19.75	22.30	2.05	1.75	2.40	1.77	2.20
June ....	19.72	27.25	18.75	20.37	2.05	1.60	2.22	1.56	2.20
July ....	16.75	21.00	16.81	18.25	1.97	1.37	2.05	1.33	2.20
Aug. ....	15.60	18.20	14.25	15.90	1.95	1.30	1.89	1.28	2.20
Sept. ....	13.87	16.93	13.62	15.00	1.95	1.25	1.65	1.30	2.20
Oct. ....	13.06	16.50	12.87	14.50	1.95	1.21	1.65	1.28	2.20
Nov. ....	13.48	18.95	12.95	14.50	1.95	1.44	1.65	1.28	2.20
Dec. ....	13.43	19.75	13.75	14.75	1.95	1.54	1.65	1.42	2.20
<b>1901</b>									
Jan. ....	13.15	19.75	13.45	14.75	1.95	1.55	1.65	1.44	2.22
Feb. ....	14.43	20.31	13.12	14.25	2.05	1.55	1.63	1.35	2.30
March ....	16.31	22.88	14.00	15.25	2.01	1.62	1.66	1.35	2.30
April ....	16.75	24.00	14.50	15.50	2.00	1.76	1.75	1.47	2.30
May ....	16.30	24.00	13.85	15.50	2.00	1.78	1.75	1.51	2.30
June ....	16.00	24.38	13.37	15.00	2.00	1.75	1.75	1.55	2.30
July ....	16.00	24.00	13.00	15.00	2.00	1.75	1.75	1.55	2.30
Aug. ....	15.75	24.20	13.00	15.00	2.00	1.75	1.75	1.56	2.30
Sept. ....	15.75	24.88	13.06	15.00	2.05	1.75	1.75	1.61	2.30
Oct. ....	15.89	26.70	13.75	14.75	2.04	1.75	1.75	1.62	2.28
Nov. ....	16.00	27.00	14.00	14.88	2.05	1.75	1.75	1.64	2.17
Dec. ....	16.31	27.50	14.25	15.50	2.05	1.75	1.75	1.65	1.99
<b>1902</b>									
Jan. ....	16.70	27.50	14.55	15.90	2.05	1.78	1.75	1.66	1.99
Feb. ....	16.93	29.37	14.75	16.50	1.95	1.78	1.75	1.68	2.05
March ....	17.37	31.25	14.75	18.16	1.95	1.78	1.85	1.84	2.05
April ....	18.75	31.50	16.87	18.62	1.96	1.81	1.90	1.92	2.05
May ....	20.75	32.20	18.35	20.50	2.05	1.95	1.99	1.96	2.05
June ....	21.56	32.37	20.19	21.50	2.05	2.00	2.11	1.99	2.05
July ....	21.60	31.75	20.75	21.25	2.05	2.00	2.27	1.95	2.05
Aug. ....	21.62	31.06	23.06	21.75	2.05	2.00	2.21	1.93	2.05
Sept. ....	21.75	29.50	25.00	23.00	2.05	2.00	2.10	1.92	2.03
Oct. ....	21.75	29.70	25.65	23.00	2.05	2.06	2.09	1.93	1.89
Nov. ....	21.68	28.50	23.62	23.00	2.05	2.10	2.00	1.87	1.85
Dec. ....	21.75	29.12	22.44	23.00	2.05	2.10	1.97	1.92	1.85

<b>1903</b>									
Jan. ....	22.15	29.60	21.65	23.10	2.07	2.10	1.78	1.93	1.89
Feb. ....	21.45	29.87	21.50	23.00	2.10	2.05	1.75	1.93	1.92
March ....	21.85	30.62	21.37	22.87	2.10	1.94	1.75	1.94	2.00
April ....	21.28	30.25	20.15	22.52	2.15	1.85	1.74	1.93	2.00
May ....	20.01	30.37	18.87	20.37	2.15	1.80	1.73	1.86	2.00
June ....	19.72	28.87	17.75	19.50	2.15	1.78	1.73	1.79	2.00
July ....	18.89	27.60	16.15	17.90	2.15	1.77	1.73	1.69	2.00
Aug. ....	18.35	27.00	15.19	16.87	2.15	1.78	1.73	1.60	2.00
Sept. ....	17.22	27.00	14.75	16.06	2.15	1.78	1.73	1.60	2.00
Oct. ....	16.05	27.00	13.50	15.35	2.15	1.78	1.73	1.50	2.00
Nov. ....	15.18	24.00	12.00	14.75	1.90	1.78	1.73	1.40	1.97
Dec. ....	14.40	23.00	12.05	14.46	1.90	1.77	1.73	1.35	1.87

<b>1904</b>									
Jan. ....	13.91	23.00	12.37	14.12	1.77	1.73	1.73	1.35	1.89
Feb. ....	13.66	23.00	12.12	13.56	1.70	1.73	1.73	1.36	1.90
March ....	14.25	23.00	12.10	13.70	1.72	1.73	1.73	1.45	1.91
April ....	14.18	23.00	12.50	14.00	1.74	1.73	1.73	1.48	1.90
May ....	13.60	23.00	12.25	13.50	1.75	1.73	1.73	1.48	1.90
June ....	12.81	23.00	11.80	13.35	1.75	1.73	1.73	1.48	1.90
July ....	12.40	23.00	11.81	13.25	1.72	1.73	1.73	1.48	1.89
Aug. ....	12.81	23.00	12.00	13.25	1.65	1.73	1.73	1.48	1.71
Sept. ....	12.63	20.00	12.00	13.50	1.60	1.57	1.57	1.45	1.60
Oct. ....	13.10	19.50	12.81	13.75	1.60	1.53	1.53	1.43	1.60
Nov. ....	14.85	20.25	15.19	15.63	1.62	1.53	1.53	1.47	1.62
Dec. ....	16.65	21.20	15.85	16.60	1.73	1.57	1.57	1.60	1.73

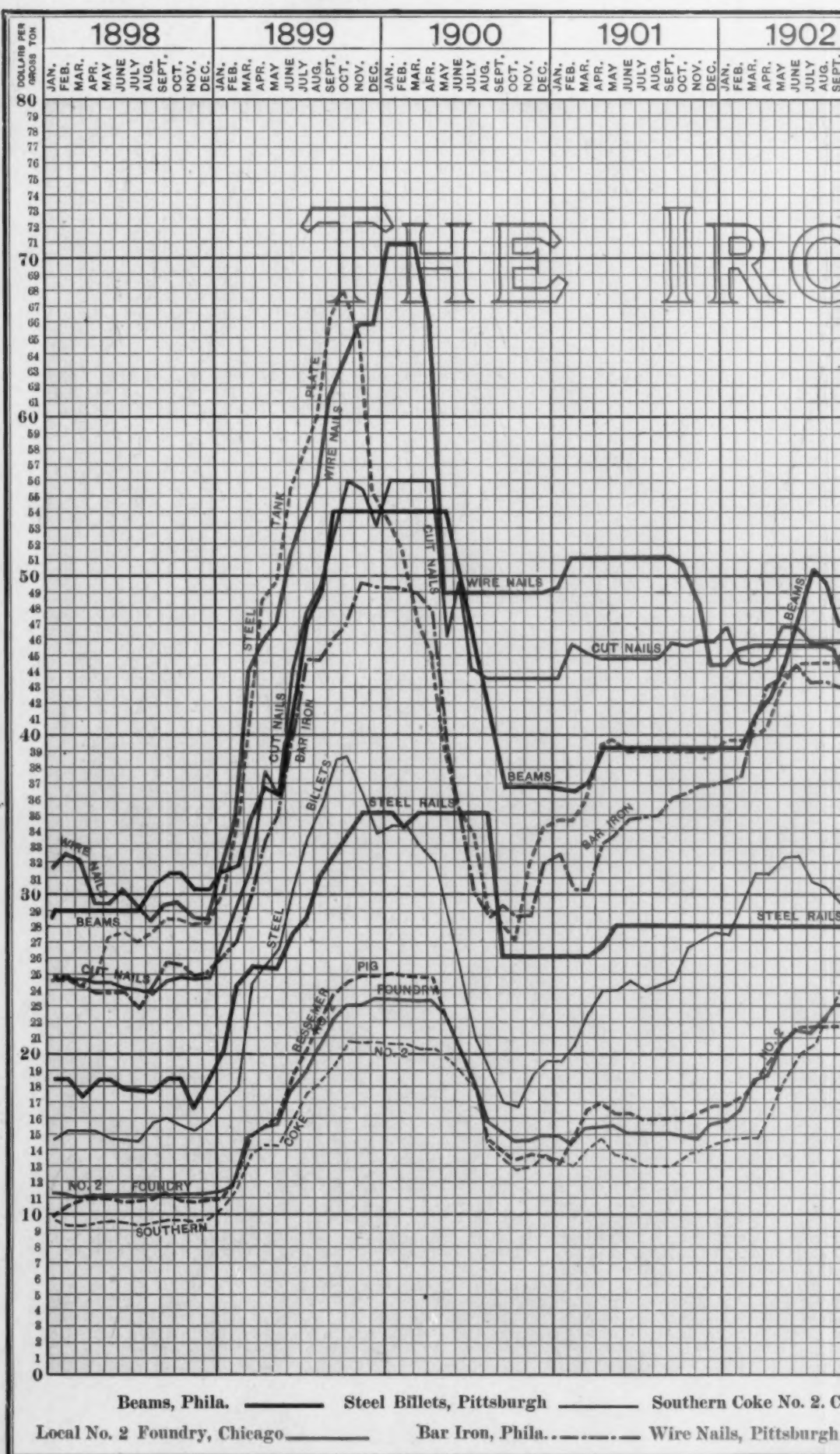
<b>1905</b>									
Jan. ....	16.85	22.75	16.25	17.50	1.75	1.63	1.63	1.65	1.75
Feb. ....	16.41	23.50	16.25	17.50	1.79	1.66	1.66	1.68	1.80
March ....	16.35	24.00	16.25	17.45	1.80	1.73	1.73	1.73	1.80
April ....	16.35	24.00	16.25	17.25	1.80	1.73	1.73	1.73	1.80
May ....	16.16	23.50	15.81	17.25	1.80	1.73	1.73	1.71	1.80
June ....	16.65	22.00	14.65	16.65	1.80	1.73	1.73	1.63	1.74
July ....	14.85	22.00	13.94	16.12	1.80	1.73	1.73	1.63	1.70
Aug. ....	15.20	24.00	14.40	16.25	1.66	1.78	1.76	1.63	1.70
Sept. ....	15.91	25.00	14.37	16.25	1.60	1.73	1.88	1.66	1.74
Oct. ....	16.54	25.62	15.31	17.31	1.65	1.73	1.87	1.78	1.80
Nov. ....	17.85	26.00	16.60	18.80	1.65	1.73	1.83	1.83	1.80
Dec. ....	18.35	26.00	16.75	19.25	1.71	1.73	1.83	1.83	1.80

<b>1906</b>									
Jan. ....	18.35	26.25	16.75	19.25	1.75	1.73	1.83	1.86	1.85
Feb. ....	18.35	26.50	16.75	19.06	1.79	1.73	1.83	1.78	1.85
March ....	18.28	26.70	16.65	19.00	1.80	1.73	1.83	1.73	1.85
April ....	18.19	27.00	16.63	18.75	1.80	1.73	1.83	1.66	1.85
May ....	18.10	26.40	16.75	18.55	1.80	1.73	1.83	1.63	1.85
June ....	18.23	26.63	16.44	18.19	1.75	1.73	1.83	1.63	1.85
July ....	18.41	27.25	16.06	18.25	1.75	1.73	1.83	1.63	1.84
Aug. ....	19.00	27.80	17.30	19.10	1.75	1.73	1.83	1.67	1.82
Sept. ....	19.54	28.00	18.69	19.81	1.80	1.73	1.83	1.76	1.86
Oct. ....	20.35	28.00	20.00	21.13	1.90	1.73	1.83	1.83	1.85
Nov. ....	22.85	28.88	23.98	24.25	1.93	1.73	1.83	1.83	1.88
Dec. ....	23.75	29.50	25.00	25.50	2.05	1.99	1.83	1.83	2.00

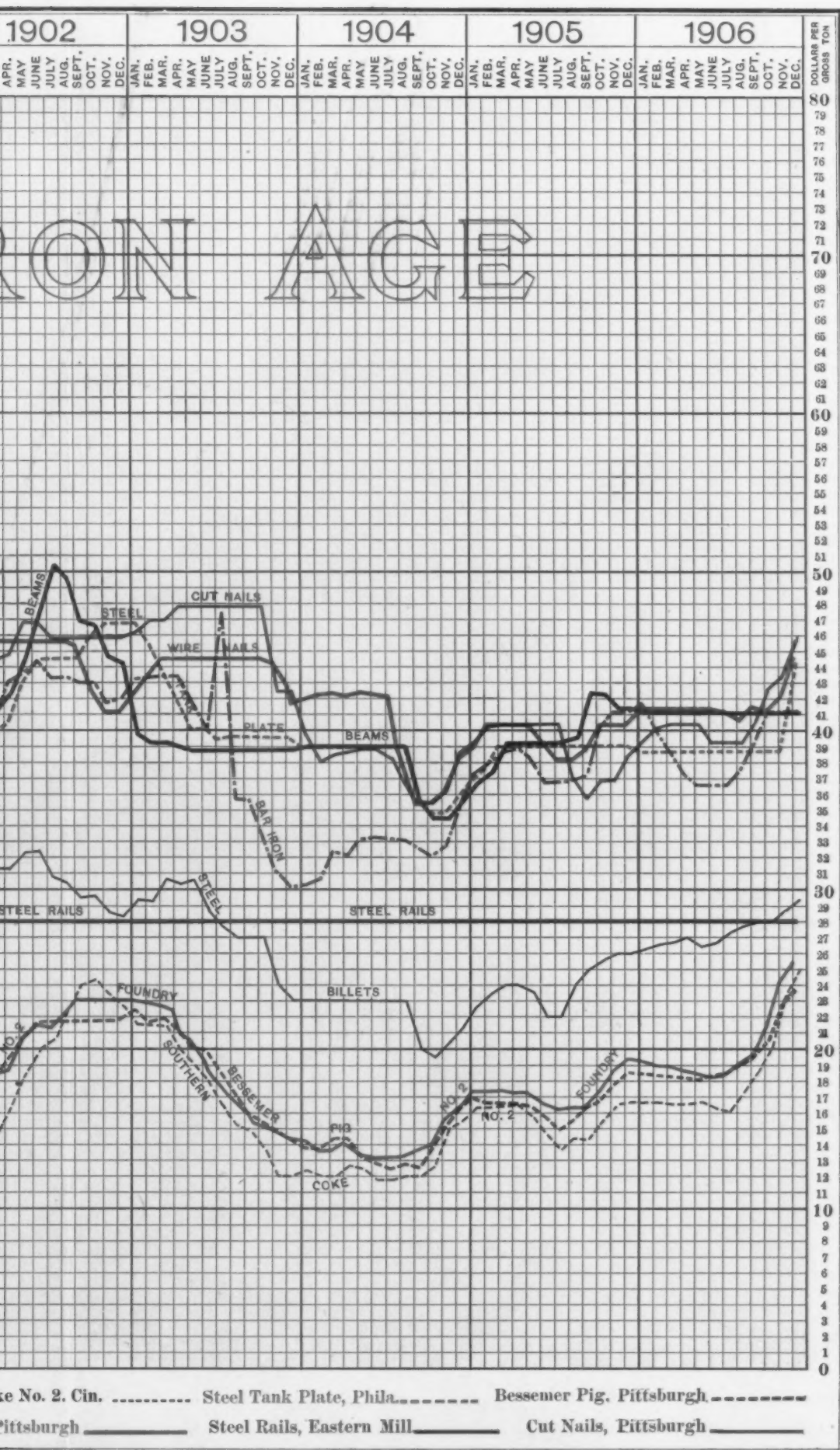
It should be noted that all the price lines plotted on the accompanying diagram refer to gross tons, the marginal figures representing dollars. In reducing finished material prices to this basis the direct relation is shown between raw material, semifinished material and rolled products. The lines for 1906 are significant for the decline in pig iron which came in June and July and for the rapid ascent in the second half of the year. The prices given represent the market for early deliveries. It will be seen that Southern iron made the high record last year for the years included by the chart. In finished material the price lines for 19







**Fluctuations in the Prices of Crude  
from January 1, 1898, to Jan**



**Crude and Finished Iron and Steel**  
**January 1, 1907—Gross Tons.**

J

D  
M  
W  
w  
re  
th  
un  
sh  
is  
on  
is  
ac  
B  
in  
ti

B  
th

C  
an  
w  
po  
so  
in  
an  
at

fin  
w  
Fe  
N  
sh  
by  
fin  
su  
Th  
its  
po  
ca  
fin  
ch  
an



## OBITUARY.

**E. P. Bullard.**

Edward Payson Bullard, Bridgeport, Conn., who died December 22, was born August 18, 1841, in Uxbridge, Mass. After the completion of his apprenticeship at the Whitin Machine Works, Whitinsville, Mass., he went to work at the Colts Armory in Hartford, Conn., where he remained until the latter part of 1863. He then entered the employ of Pratt & Whitney, working as a machinist until April, 1865. At this time he formed the partnership of Bullard & Prest, carrying on a general machinists' business in the old County Jail Building, Hartford, on which site the Case, Lockwood & Brainard Company is now located. In March, 1865, William Parsons was admitted to the partnership and the name changed to Bullard, Prest & Parsons, Mr. Prest withdrawing early in 1866 and the firm becoming Bullard & Parsons. Vertical drill presses (one of which is now in use at the



EDWARD PAYSON BULLARD.

Bullard works) and pumps were the chief product of the firm.

With the idea of moving the business to Norwalk, Conn., Mr. Bullard, in September, 1866, went to that city and interested a number of men in the project, the Norwalk Iron Works Company being organized for that purpose on October 5, 1866, with Mr. Bullard and Mr. Parsons as members of the Board of Directors. Changes in the plans were subsequently made, Messrs. Bullard and Parsons withdrawing and continuing their business at Hartford.

The depression of 1868 and lack of capital forced the firm into bankruptcy in August, 1868. A reorganization was effected and, removing to Bristol, Conn., Gray's Foundry (established some years previously by Elisha N. Welch, later known as a great clock maker) now the site of the Sessions Foundry Company, was purchased by them and operated for a period of a year, when the firm dissolved and Mr. Bullard secured the position of superintendent in a large machine shop at Athens, Ga. The bitter feeling against all Northerners was then at its height, and on that account Mr. Bullard resigned his position and went to Cincinnati, Ohio, where he soon became known as a dealer in second-hand machinery. His first sale was of a large number of Lincoln milling machines which he had found in an abandoned Confederate arsenal in Georgia. He then connected himself with the

Cincinnati branch of Post & Co., organizing their machine tool department, which has since become E. A. Kinsey & Co.

Early in 1872 he went to Columbus, Ohio, to assume the position of general superintendent of the Gill Car Works in that city, leaving there in 1874 when the plant was closed down as a result of the panic of 1873. For a short time in 1874 he was superintendent of the Cooper Engine Works at Mt. Vernon, Ohio. Leaving there he established himself in the machinery business on Beekman street, New York City, in 1875, organizing Allis, Bullard & Co., at 14 Dey street, one year later. Mr. Allis withdrew in 1877 and the Bullard Machine Company was organized, continuing the business at the same address until 1880, when Mr. Bullard secured entire control and continued as E. P. Bullard, dealer.

Recognizing the demand for a high grade lathe, in 1880 he went to Bridgeport, Conn., and engaged A. D. Laws to manufacture lathes of his design, he agreeing to take the entire output of the plant. Owing to certain unsatisfactory features of the arrangement Mr. Bullard in the latter part of the same year took over the business and styled it the Bridgeport Machine Tool Works, he being the sole owner.

In 1883 he designed his first vertical boring and turning mill—a single head, belt feed machine having a capacity of 37 in., which was later sold to George A. Young, a manufacturer of paint making machinery in Brooklyn, N. Y. This is believed to be the first machine of this type having such small capacity, boring and turning work of this size then being done in the face plate of a lathe. In 1889 business in Bridgeport had increased to such an extent that he discontinued his New York connections and devoted his entire time to the development of the Bridgeport plant, J. J. McCabe, a member of Mr. Bullard's New York staff, establishing himself in the old warerooms. The Bridgeport Machine Tool Works was incorporated in 1894 under the name of the Bullard Machine Tool Company, the ownership of stock being entirely in the hands of Mr. Bullard and his sons. Under this name the business is still being carried on.

ROBERT H. SAYRE, chairman of the Board of Trustees of the Lehigh University, died January 4, at South Bethlehem, Pa., aged 83 years. Mr. Sayre was born in Columbia County, Pa., on October 13, 1824. He was a member of the engineering corps engaged in enlarging the Morris Canal in 1840. Mr. Sayre devoted some years to developing coal mines, and saw 11 years' service with the Lehigh Coal & Navigation Company. At the end of this term he was elected vice-president of the Delaware, Lehigh, Schuylkill & Susquehanna Railroad, now the Lehigh Valley, serving from 1852 to 1882. He became president and chief engineer of the Southern Pennsylvania Railroad, and then was made second vice-president of the Lehigh Valley, with full charge of traffic and engineering departments and the building of the line to Buffalo and the branch roads. Mr. Sayre was one of the pioneers in the introduction of iron bridges and steel fireboxes, and was the first to put into use the fish bar track joint. He was among the first men to begin the use of steel rails. This he did in 1864. He promoted the Bethlehem Iron Company, became its general manager in 1886 and the vice-president in 1891.

JAMES CLAYTON, who was well known as an inventor, died January 3, in Brooklyn, N. Y., aged 85 years. He was born in Shropshire, England, and came to this country in 1849. In 1864 Mr. Clayton began manufacturing water and other pumps in Brooklyn. He invented many kinds of pumps and other processes in the mechanical line. His best known invention was an air compressor. He retired from business five years ago. He leaves a widow and a daughter.

A. W. KEATE, manager of the business of J. & W. Jolly, manufacturers of turbine water wheels, Holyoke, Mass., died recently in that city.

CLINTON K. LAMSON, formerly president of the Independent Whip Company and of the Foster Machine Company, Westfield, Mass., died in that place January 6, aged 78 years. He was a native of Granville, Mass.

Ja

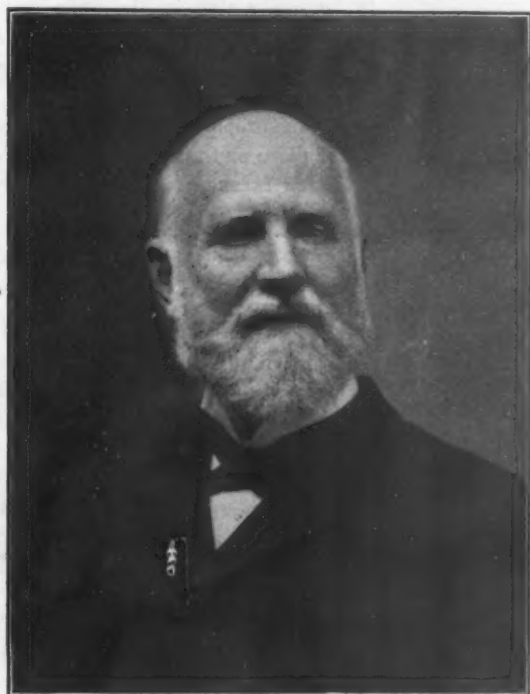
De  
Ma  
W  
wo  
re  
th  
un  
sh  
ist  
on  
is  
ad  
Bu  
in  
tic

B  
th  
C  
a  
w  
p  
s  
in  
a  
a  
fi  
w  
E  
N  
s  
b  
fi  
s  
T  
in  
p  
c  
fi  
c  
a

## OBITUARY.

**E. P. Bullard.**

Edward Payson Bullard, Bridgeport, Conn., who died December 22, was born August 18, 1841, in Uxbridge, Mass. After the completion of his apprenticeship at the Whitin Machine Works, Whitinsville, Mass., he went to work at the Colts Armory in Hartford, Conn., where he remained until the latter part of 1863. He then entered the employ of Pratt & Whitney, working as a machinist until April, 1865. At this time he formed the partnership of Bullard & Prest, carrying on a general machinists' business in the old County Jail Building, Hartford, on which site the Case, Lockwood & Brainard Company is now located. In March, 1865, William Parsons was admitted to the partnership and the name changed to Bullard, Prest & Parsons, Mr. Prest withdrawing early in 1866 and the firm becoming Bullard & Parsons. Vertical drill presses (one of which is now in use at the



EDWARD PAYSON BULLARD.

Bullard works) and pumps were the chief product of the firm.

With the idea of moving the business to Norwalk, Conn., Mr. Bullard, in September, 1866, went to that city and interested a number of men in the project, the Norwalk Iron Works Company being organized for that purpose on October 5, 1866, with Mr. Bullard and Mr. Parsons as members of the Board of Directors. Changes in the plans were subsequently made, Messrs. Bullard and Parsons withdrawing and continuing their business at Hartford.

The depression of 1868 and lack of capital forced the firm into bankruptcy in August, 1868. A reorganization was effected and, removing to Bristol, Conn., Gray's Foundry (established some years previously by Elisha N. Welch, later known as a great clock maker) now the site of the Sessions Foundry Company, was purchased by them and operated for a period of a year, when the firm dissolved and Mr. Bullard secured the position of superintendent in a large machine shop at Athens, Ga. The bitter feeling against all Northerners was then at its height, and on that account Mr. Bullard resigned his position and went to Cincinnati, Ohio, where he soon became known as a dealer in second-hand machinery. His first sale was of a large number of Lincoln milling machines which he had found in an abandoned Confederate arsenal in Georgia. He then connected himself with the

Cincinnati branch of Post & Co., organizing their machine tool department, which has since become E. A. Kinsey & Co.

Early in 1872 he went to Columbus, Ohio, to assume the position of general superintendent of the Gill Car Works in that city, leaving there in 1874 when the plant was closed down as a result of the panic of 1873. For a short time in 1874 he was superintendent of the Cooper Engine Works at Mt. Vernon, Ohio. Leaving there he established himself in the machinery business on Beekman street, New York City, in 1875, organizing Allis, Bullard & Co., at 14 Dey street, one year later. Mr. Allis withdrew in 1877 and the Bullard Machine Company was organized, continuing the business at the same address until 1880, when Mr. Bullard secured entire control and continued as E. P. Bullard, dealer.

Recognizing the demand for a high grade lathe, in 1880 he went to Bridgeport, Conn., and engaged A. D. Laws to manufacture lathes of his design, he agreeing to take the entire output of the plant. Owing to certain unsatisfactory features of the arrangement Mr. Bullard in the latter part of the same year took over the business and styled it the Bridgeport Machine Tool Works, he being the sole owner.

In 1883 he designed his first vertical boring and turning mill—a single head, belt feed machine having a capacity of 37 in., which was later sold to George A. Young, a manufacturer of paint making machinery in Brooklyn, N. Y. This is believed to be the first machine of this type having such small capacity, boring and turning work of this size then being done in the face plate of a lathe. In 1889 business in Bridgeport had increased to such an extent that he discontinued his New York connections and devoted his entire time to the development of the Bridgeport plant, J. J. McCabe, a member of Mr. Bullard's New York staff, establishing himself in the old warehouses. The Bridgeport Machine Tool Works was incorporated in 1894 under the name of the Bullard Machine Tool Company, the ownership of stock being entirely in the hands of Mr. Bullard and his sons. Under this name the business is still being carried on.

ROBERT H. SAYRE, chairman of the Board of Trustees of the Lehigh University, died January 4, at South Bethlehem, Pa., aged 83 years. Mr. Sayre was born in Columbia County, Pa., on October 13, 1824. He was a member of the engineering corps engaged in enlarging the Morris Canal in 1840. Mr. Sayre devoted some years to developing coal mines, and saw 11 years' service with the Lehigh Coal & Navigation Company. At the end of this term he was elected vice-president of the Delaware, Lehigh, Schuylkill & Susquehanna Railroad, now the Lehigh Valley, serving from 1852 to 1882. He became president and chief engineer of the Southern Pennsylvania Railroad, and then was made second vice-president of the Lehigh Valley, with full charge of traffic and engineering departments and the building of the line to Buffalo and the branch roads. Mr. Sayre was one of the pioneers in the introduction of iron bridges and steel fireboxes, and was the first to put into use the fish bar track joint. He was among the first men to begin the use of steel rails. This he did in 1864. He promoted the Bethlehem Iron Company, became its general manager in 1886 and the vice-president in 1891.

JAMES CLAYTON, who was well known as an inventor, died January 3, in Brooklyn, N. Y., aged 85 years. He was born in Shropshire, England, and came to this country in 1849. In 1864 Mr. Clayton began manufacturing water and other pumps in Brooklyn. He invented many kinds of pumps and other processes in the mechanical line. His best known invention was an air compressor. He retired from business five years ago. He leaves a widow and a daughter.

A. W. KEATE, manager of the business of J. & W. Jolly, manufacturers of turbine water wheels, Holyoke, Mass., died recently in that city.

CLINTON K. LAMSON, formerly president of the Independent Whip Company and of the Foster Machine Company, Westfield, Mass., died in that place January 6, aged 78 years. He was a native of Granville, Mass.





To-day the matter of price does not enter into buying to any great extent. Everything hinges on deliveries. If earliest possible deliveries are wanted, as is usually the case, the greater the number of manufacturers and dealers who know the customer's wants the earlier will his requirements be met. Such has been the experience of those who have availed themselves of this modern method of buying. One dealer may have some machine unexpectedly canceled by a customer; a manufacturer may have one or two machines of a lot which for some reason remained unsold; or perhaps some dealer may know of a second-hand machine which will serve the purpose of the buyer. Thus here and there the list may be filled out through the multitude of those to whom the information is given, when it would be absolutely impossible for the few dealers and manufacturers, taken privately into the confidence of the buyer, to serve his interests with anywhere near the same efficiency.

### A Cure for the Absent and Tardy Habit.

There is wisdom in the method of increasing wages as announced by one of the large works of New England. An advance of 5 per cent. to go into effect immediately is coupled with the agreement to pay to each employee an additional 2 per cent. in a lump sum on June 1, provided that the employee is not absent from work more than six working days, except for sickness, during the intervening period from January 1. A premium is thus placed on constant, faithful service. There is always present in large works, and even in small ones, a percentage, more or less considerable, of workmen who like to take a day or two off occasionally, or who are prone to be late at their work or early to leave it. When the employer can pick and choose his labor the effort may be made to eliminate the absentee element and to confine the working force to those who can be depended upon for regular service. Now, however, a man's services are rarely dispensed with for such a reason, unless he is so flagrant an offender as to render him really useless.

When a shop is being rushed to its full capacity, when every machine is being given all that it can do, running constantly, it is disorganizing to have a man leave his work even for a short time. There may be none to take his place, or if there is the substitute cannot be expected to take up the job and be instantly as efficient as he who regularly works at it. The promise of an additional sum of money to be paid only where work has been consistently constant should have a most beneficial deterring effect on the habitual absentee element. It is a habit that would be worth breaking for the good of the employer as well as the employee.

### Trade Agreements

Among the noteworthy developments of the past year was the loosening of the bonds by which steel manufacturers in important lines had been held together in price agreements for a number of years. While the action thus taken was voluntary, it was induced by the attitude toward trade combinations of both the National Administration and the authorities of various States. It is evident that public opinion is now strongly arrayed against concerted efforts of manufacturers to maintain a uniform price. This is the natural reaction toward individualism in business from the erstwhile tendency to consolidate everything. From a disposition to accept as an irresistible result of modern business progress the amalgamation of

competing interests, there has been a gradual change to aggressive hostility not only to further advancement in that direction but also to whatever may have already been done in controlling trade. Hence, those who are charged with the duty of enforcing laws have been spurred to taking official cognizance of trade combinations with the intention of suppressing them, and some States have placed on their statute books more stringent and in some cases even drastic measures to strengthen the power of their prosecuting officers. So effective have these measures proved that even comparatively innocent trade associations are careful not to hold meetings in certain States lest their members domiciled in those States be subjected to prosecution for daring to seem to defy the local authorities by conferring with their fellow manufacturers. It might not be possible to prove them guilty of illegal acts, but manufacturers are anxious to avoid the obloquy which such a prosecution would cast upon them in the estimation of valued customers. It is particularly desirable at such a time as this that large corporations should avoid participation in any action likely to excite popular prejudice against them, as they are already targets for attack simply because they are large.

## CORRESPONDENCE.

### Corrosion of Steel in Cinder Concrete.

*To the Editor:* In your issue of December 20 I noted the article on "The Corrosion of Reinforcing Metal" in cinder concrete floors in San Francisco. This is a subject that has been threshed over a great many times, and discussion is reopened from time to time when inexperienced persons note oxidation in metal that has been imbedded in concrete.

In dealing with corrosion of iron and steel three active agents producing it are recognized. These are water, carbonic acid and sulphuric acid. Pure water, free from carbonic acid, will not attack steel, but unprotected steel work is rapidly corroded by either carbonic or sulphuric acid in aqueous solution, or by contact with these acids in a damp atmosphere.

More than 10 years ago a number of analyses and tests were made at the suggestion of the writer by Booth, Garrett & Blair, chemists, of Philadelphia, and others, to determine the effect of cinder concrete on structural steel and imbedded metal. From a number of tests made under practical working conditions it was found that there is an initial oxidation when naked steel is imbedded in the wet concrete wherever voids occur in the concrete adjacent to the steel, and that this oxidation continues at a rapid rate as long as moisture is present; that after the moisture is eliminated and the average conditions obtain that are found in an ordinary building covered with a good roof, the oxidation progresses very slowly indeed and at a decreasing rate with time. The above facts are true whether stone or cinder aggregates are used in the concrete.

In the absence of any evidence to the contrary, it is the writer's belief that the oxidation noted in the various buildings in San Francisco was produced almost entirely during the period of the construction of the buildings, especially since San Francisco has a wet season during a large portion of the year, and the conditions could easily be such as to produce the results described during the period of construction.

### LITTLE SULPHURIC ACID IN CINDER CONCRETE.

Contrary to popular opinion in regard to cinder concrete, it actually contains very little sulphuric acid. The average of 13 samples shows only about two-tenths of 1 per cent. of free sulphuric acid, and about the same amount of sulphur in the form of sulphides. Sand usually contains only a trace of sulphur as sulphide, and this ingredient of the concrete can be ignored. Taking the average Portland cement as containing 1 per cent. of sulphuric acid and only a trace of sulphur as sulphide, we



have a total of sulphuric acid in the usual proportions of concrete in proportion to the cement, as follows:

	Per cent.
100 parts cement, sulphuric acid.....	1.00
200 parts sand, sulphuric acid (none).....	0.00
500 parts cinder (0.20 $\text{SO}_2$ ) (0.20 S, hydrated $\text{SO}_3$ ).....	8.50
Total.....	4.50

Or the total sulphuric acid present in the concrete would be approximately 4.50 per cent. of the weight of the cement. If this amount of sulphuric acid were actually able to react upon the cement, it would seriously affect it and retard its setting. The 1 per cent. of sulphuric acid in the cement is, however, largely in combination with stable sulphates and sulphides, and the 3.5 per cent. in the cinder could only react on the cement, if the cinder were ground to an extremely fine powder and intimately mixed with the cement before hydration. The cinder is, however, in lumps, many of which are hard and semivitrified, and the conditions are quite unfavorable to chemical reaction.

Consequently, a small fractional part only of the acid is effective, and this part is completely neutralized by the alkaline properties of the cement, as is proved by the practical tests referred to above, and the fact that the cement sets in approximately the same period as when limestone, granite or trap rock aggregates are used for the concrete.

What precedes refers only to naked or unprotected metal imbedded in the concrete. It is well known that structural steel, as furnished in practice, is usually covered with two coats of a suitable weatherproof paint. This has in all cases been found sufficient to protect the structural members from any initial oxidation, due to voids in contact with the metal, until the moisture of the green concrete has been completely eliminated.

#### EXPERIENCE AND OBSERVATION AGAINST THE SAN FRANCISCO REPORT.

In my experience, extending over 15 years, I have personally examined a great many buildings where alterations, &c., have required both cinder and stone concrete to be removed where it has been in contact with structural steel. I should say that not less than 25 separate and individual cases of this kind have come under my personal observation, and in which the concrete had been in contact with structural steel for periods ranging from two to eight years. In all these instances there was not a single one that did not show the paint on the steel work intact and in perfect condition, with absolutely no sign of oxidation except in a few small spots where the paint had been accidentally abraded in contact with hard or cutting edges during the construction of the building. Such spots, where in contact with voids, showed oxidation. The average surface, however, where cinder or stone concrete was in contact with structural steel (as where floor arches abutted against the steel beams) showed less corrosion than where the brick and stone mason work and ordinary mortar came in contact with other portions of the steel frame covered with the same paint. This was true in every case where the corrosive effects of the concrete and mason work could be compared. This result was probably due to the fact that brick and stone masonry, on account of the method of placing it, generally had more voids in the surfaces in contact with structural steel than the concrete work.

From my experience and observation I am thoroughly convinced that there is practically no difference, so far as the oxidation of steel is concerned, whether it is imbedded in cinder concrete or in stone concrete. In all cases a thorough mixture of the concrete should be required, in order that the cement may completely neutralize any acid that may be present in the aggregates.

#### A MISTAKE IN CONDEMNING CINDER CONCRETE.

The Structural Association of San Francisco is certainly making a mistake in condemning cinder concrete as a material for fireproofing purposes, on the strength of the few facts and evidence that have been presented in the report of its committee. It has ignored the fact that in many cases segmental arches are employed for floor construction, in which the strength is not dependent on any metal imbedded in the concrete, and in which the entire section of the concrete is in compression. The

methods in which bars are used at intervals of from 12 to 24 in. have also been excluded from the committee's consideration. Where bars of considerable section are employed the larger sections of the metal are much better adapted to resist oxidation, whether initial or otherwise, than where the metal is distributed uniformly in light section and in the form of mesh.

Cinder concrete is now quite generally recognized by the leading authorities as one of the best fire and water resisting materials known at the present time that is available at a low cost. It is light, porous and amply strong for the requirements of ordinary floor construction in fireproof buildings, developing approximately one-half the crushing strength of stone concrete. It is doubtful if any material will be found in the near future that will prove as efficient, as economical and as well adapted for fireproof floors as cinder concrete. It would, besides, be a decided hardship, on account of involving additional cost to owners of many buildings, if this material could not be used for fireproofing purposes in San Francisco.

A. L. A. HIMMELWRIGHT.

NEW YORK, January 2, 1907.

#### Facts About the Mexican Iron Industry.

To the Editor: In *The Iron Age* of December 20 appeared an article entitled "The Mexican Iron Industry," which, to draw it mildly, is not strictly correct.

In the first place there is no lack of "proper fuel," not to mention charcoal. The extensive coal fields of the State of Coahuila, said to be 2400 square miles in area, furnish coal that yields coke of better quality than Alabama, and about equal to Blossburgh, Pa., though inferior to Connellsville and Pocahontas. The ash ranges from 15 per cent. in washed to 18 per cent. in unwashed coke, and occasionally as low as 12 per cent., while a fair average may be taken at 16 per cent., with sulphur lower than Connellsville. Physically it is very tough, and so stands handling and transportation better than most coke, as it usually contains 2 to 3 per cent. of iron that may be properly deducted from the ash when used in iron blast furnaces. Lime is also high. The price of coke given is, I believe, excessive and probably applies to Mexico City, after a long haul up to the altitude of over 8000 ft. At Durango coke ranged from \$13 to \$18, Mexican money, in small and irregular shipments.

Foreign pig iron cannot be laid down at consuming points at the present time under \$80, Mexican, while six months ago native pig sold for \$65. Its cost at Monterey should not have exceeded \$21 per ton, which would be the cost at Durango in a modern furnace, the longer coke haul being offset by iron ore delivered in the stock house by contract at 15 Mexican cents per metric ton.

Pig iron made with by-product charcoal would not cost at Durango \$10, Mexican, per ton.

The old "iron making plant" referred to is not in ruins, but has been in operation within six or seven years.

In the interest of history, I would state that that plant was built by some Germans over 60 years ago, and operated with success by Don Marcos Ison, an Englishman and a relative of John Ball, who was a puddler and managed that department and now lives in Durango, a well preserved and much respected citizen.

The Chihuahua plant never made a pound of wrought iron, it being a scrap proposition, using the pig (or old car wheels) and scrap process for mild steel, and formerly rolled imported steel billets into merchant shapes.

The statement that there is "small prospect" of the Durango plant ever starting again verges on the gratuitous. The further statement that the cause of the shut-down was "because the operation was not profitable" is only true in part. The real cause was on account of the death of the principal owner and financial backer, who made no provision for operating the works, but did provide for their sale. The statement is incorrect that "the company borrowed money heavily from the local banks and kept the works going in the hope of selling the property. When the hope failed to be realized, operations ceased." Further than this the matter in question will not be explained.



The whole article referred to is a marvel in its way in the number and character of its errors and false statements, and its whole purport and tenor are so well calculated to deter the investment of capital in iron and steel business in Mexico as to arouse the suspicion that it was inspired for that purpose in the interest of outsiders.

My principal motive for replying to the article entitled "The Mexican Iron Industry" is the fact that I am endeavoring to sell the Durango iron property and cannot afford to let such an article go unchallenged. If that consular report is a fair sample of the American brand, the State Department must be accumulating a fine line of misinformation.

T. F. WITHERBEE.

MELROSE HIGHLANDS, MASS., January 1, 1907.

### The Philadelphia Foundrymen's Association.

The annual meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city Wednesday evening, January 2. Dr. Elmer E. Brown occupied the chair. The annual report of the treasurer was received, showing that after paying all expenses incurred during the year the balance on hand amounted to over \$2000.

Chairman Brown of the General Entertainment Committee reported that his committee had met and discussed the plans for the entertainment of the American Foundrymen's Association, but that it was too early to make any definite announcements.

Edward J. Etting, trading in foundry equipment and supplies, with offices in the Harrison Building, Philadelphia, was elected to regular membership in the association.

An invitation from the New England Foundrymen's Association to attend its annual meeting on January 9 in Boston, Mass., was read, and efforts were at once made to insure a good sized delegation.

The annual election of officers followed. There being no opposition to the nominations made at the last meeting, the unanimous vote of the association was cast as follows:

President, Thomas Devlin, Thomas Devlin Mfg. Company, Philadelphia; vice-president, Alex. E. Outerbridge, Jr., Wm. Sellers & Co., Incorporated, Philadelphia; treasurer, Josiah Thompson, J. Thompson & Co., Philadelphia; secretary, Howard Evans, J. W. Paxson & Co., Philadelphia. Executive Committee: E. E. Brown, E. E. Brown & Co., Philadelphia; Thomas M. Eynon, Eynon-Evans Mfg. Company, Philadelphia; George C. Davis, chemist, Philadelphia; H. L. Haldeman, Pulaski Iron Company, Philadelphia; W. O. Steele, Bateman Mfg. Company, Grenloch, N. J. Trustees: Thomas Devlin, president; Josiah Thompson, treasurer; Howard Evans, secretary. Official Chemist: George C. Davis, Philadelphia.

The paper before the association was on "An Improved Attachment for the Wadsworth Core Machine," by W. O. Steele of the Bateman Mfg. Company, Grenloch, N. J. This was fully described in *The Iron Age* of September 27, 1906, under the title "Improvements in Core-making," by the same writer.

An informal banquet at which Dr. Brown acted as toastmaster followed the meeting, during which short addresses were made by Harris Tabor, Wilfred Lewis, Josiah Thompson, A. Simonson, W. O. Steele, and others.

The bridge shop and new steel plant of Milliken Brothers, Incorporated, on Staten Island, will be visited by the members of the American Society of Civil Engineers January 17, the visit being a part of the programme of the fifty-fourth annual meeting of that body. The regular sessions will be held at the Society House, 220 West Fifty-seventh street, New York, beginning at 10 a.m., January 16.

The American Sheet & Tin Plate Company last week put into operation at its Vandergrift Works, Vandergrift, Pa., a modern plant for the manufacture of sulphuric acid. Its capacity is about 10,000 tons per annum.

### PERSONAL.

Charles M. Brown, secretary of the Colonial Steel Company, Pittsburgh, has been elected a director of the South Side Trust Company of that city.

James A. Childs, for nearly 20 years superintendent of the Adelaide works of the H. C. Frick Coke Company, near Connellsville, Pa., has resigned and has been succeeded by Herbert Boyd.

John S. Oursler has been appointed district manager of the Carnegie Steel Company, in charge of the Sharon, New Castle and South Sharon plants.

W. H. Lewis, formerly general superintendent of the Sharon and South Sharon plants of the Carnegie Steel Company, has resigned to become general superintendent of the new open hearth steel plant to be erected by the Jones & Laughlin Steel Company at Aliquippa, Pa.

J. A. Whaling, late purchasing agent for the Wisconsin Central Railway Company, has been appointed purchasing agent of the Semet-Solvay Company, Syracuse, N. Y., his appointment to become effective February 1, 1907.

Francis F. Coleman, formerly with the Westinghouse and Allis-Chalmers companies and recently with the Traylor Engineering Company, has joined the Lidgerwood Mfg. Company, 96 Liberty street, New York, as publicity manager. Mr. Coleman was for a time the editor of the *Electrical Age*, before the late Louis Cassier bought that publication.

C. E. Thomas, recently general manager of the Cleveland Punch & Shear Works Company, Cleveland, Ohio, has retired on account of poor health and is now located in St. Augustine, Fla.

Willard N. Sawyer this week assumed his new position of general manager of the Wellman-Seaver-Morgan Company, Cleveland, Ohio. He takes the place that has remained vacant since the death of Charles H. Wellman in the wreck of the Lake Shore Twentieth Century Limited, nearly two years ago. For the past two years Mr. Sawyer has been general manager of the Lake Superior Corporation, at Sault Ste. Marie, and as a token of their esteem the officials and employees of the corporation presented him with a solid silver tea service before his departure.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, and Archibald Johnston, president of the Bethlehem Steel Company, sailed for Europe January 8.

David Williams, president of the David Williams Company, publisher of *The Iron Age*, sailed for Europe on Saturday last.

Phil. C. Moore has been appointed general sales agent of the Pickands-Magee Coke Company, Frick Building, Pittsburgh. He was formerly with the Washington Coal & Coke Company at Dawson, Pa.

Thomas McDonald, for a number of years general superintendent of the Ohio Works of the Carnegie Steel Company at Youngstown, Ohio, has been made general superintendent of the Youngstown District, including the Ohio Works, Niles Furnace, Upper and Lower mills of the Union Works at Youngstown and the hoop mill at Greenville, Pa. Joseph A. McDonald, who has been superintendent at the Ohio Works, has also been appointed superintendent of the Niles Furnace. Fred B. Baugh, who has been district superintendent of the Upper and Lower mills and the Greenville plant, has been made superintendent of the bar mills at the Union Works, Youngstown, Ohio, and the Greenville Works, at Greenville, Pa. R. L. Hughes, who has been assistant general superintendent at the Union Works and the Greenville plant, has been made assistant to Mr. Baugh.

William J. Clark, general manager of the foreign department of the General Electric Company and well known as the author of "Commercial Cuba," has been appointed by Governor Hughes a delegate to the national convention for the extension of the foreign commerce of the United States, to be held at Washington next week.

The British Engineering Standards Committee has just issued three complete tables of British standard screw threads.

## November Iron and Steel Exports and Imports.

Cross currents are shown in a comparison of the November figures with those for October, as issued by the Bureau of Statistics of the Department of Commerce and Labor. In both exports and imports of iron and steel a decrease is shown in the total value for November, while in the case of commodities for which quantities are given increases appear. The total value of exports of all kinds of iron and steel and manufactures thereof, not including ore, in November was \$15,145,996, against \$15,910,437 in October. The total value of similar imports in November was \$3,055,823, against \$3,407,763 in October. The exports of commodities for which quantities are given reached a total of 116,675 gross tons in November, against 104,626 tons in October, 89,319 tons in September, 111,260 tons in August and 98,409 tons in July. The following table gives the exports of such commodities for November and for the 11 months ending with November in 1906 and 1905:

Exports of Iron and Steel.

Commodities.	November,		Eleven months,	
	1906.	1905.	1906.	1905.
Gross tons. Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	9,589	4,567	75,052	45,779
Scrap .....	671	655	10,602	7,215
Bar iron .....	4,291	2,692	51,241	29,287
Wire rods.....	172	959	5,850	5,795
Steel bars.....	3,725	1,025	28,869	19,094
Billets, ingots, blooms	5,847	23,252	186,479	203,132
Hoop, band, scroll....	200	468	4,369	3,826
Steel rails.....	23,863	23,365	296,873	273,306
Iron sheets and plates.	2,095	783	15,358	6,448
Steel sheets and plates.	10,071	7,944	87,436	61,304
Tin plates andterne plates .....	445	569	11,502	7,498
Structural iron and steel .....	7,815	10,068	101,275	73,469
Wire .....	16,652	19,601	160,844	129,845
Cut nails.....	357	293	7,111	7,497
Wire nails.....	2,436	2,545	44,044	33,138
All other nails, including tacks.....	537	284	4,906	3,762
Pipes and fittings*.....	27,909	8,653	151,271	.....
Totals.....	116,675	107,723	1,243,082	910,395

\* Quantity not stated prior to July 1, 1905.

The most important increase in the November exports is shown in the case of pipes and fittings, in which the November exports were 27,909 gross tons, against 12,718 tons in October.

The total imports of commodities for which quantities are given were 61,370 gross tons in November, against 51,715 tons in October, 39,679 tons in September, 34,112 tons in August and 52,715 tons in July. The imports of such commodities for November and for the 11 months ending with November in 1906 and 1905 were as follows:

Imports of Iron and Steel.

Commodities.	November,		Eleven months,	
	1906.	1905.	1906.	1905.
Gross tons. Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	39,751	14,999	305,416	185,890
Scrap .....	7,249	3,136	18,379	15,740
Bar iron .....	2,704	4,960	31,458	34,148
Rails .....	958	144	4,655	16,704
Hoop, band, scroll....	238	340	10,200	2,807
Billets, slabs, bars, &c., steel in forms n.e.s.	2,071	1,241	19,139	12,742
Sheets and plates....	169	233	3,055	2,111
Tin plates andterne plates .....	5,094	3,655	48,931	62,433
Wire rods.....	1,188	1,596	16,269	16,054
Wire and articles made from .....	700	476	5,837	3,577
Structural iron and steel .....	1,248	2,649	27,872	12,553
Totals.....	61,370	33,429	491,211	364,759

The total value of exports, not including ore, in the 11 months ending with November was \$157,755,316, against \$128,944,252 in the corresponding period of the previous year. The total values of the imports, not including ore, were respectively \$30,840,473 and \$23,912,947. The quantity of iron ore exports in the 11 months ending with November was 264,764 gross tons, against 198,715 tons in the corresponding period of the previous year, while the imports were respectively 992,283 tons and 771,001 tons.

## Progress of the Heroult Process.

We are advised by R. H. Wolff, the American representative of the Héroult electric furnace and process, that in addition to the plants at La Praz, France, and Kotsfors, Sweden, which smelt scrap and ore and refine in the Héroult electric furnaces, and in addition to the Remscheid plant, which is operated in connection with the basic open hearth furnace, the German company has closed four more licenses with German and Austrian crucible steel makers. The Saut du Tarne Steel Works in France will soon be ready for operations, and arrangements are now being concluded with a French steel syndicate to install additional Héroult plants. The Remscheid Works are to be considerably enlarged. In this country a contract has been signed with H. H. Noble, president of the North California Power Company, to build a 25-ton plant near Redding, Cal.

Dr. Héroult, who is now in this country, has developed an electrically heated steel mixer, as an adjunct to batteries of open hearth steel furnaces which make steel for staple products, like rails, shapes, &c. The steel is transferred to the electric mixer, where it is kept in a reducing atmosphere and where it is deoxidized and desulphurized and is kept at a uniform temperature and from which it is cast into ingots to suit the requirements of the mill.

## The Baldwin Locomotive Works' Largest Year.

The number of locomotives built at the Baldwin Locomotive Works, Philadelphia, Pa., in the year 1906 was 2652, comprising 201 electric and 2451 steam. Of the 2451 steam engines 133 were equipped with compound cylinders. Most of these were for domestic service, but 281 were shipped abroad, going to the following countries: Costa Rica, Colombia, Argentina, Japan, Italy, Egypt, Cuba, Philippines, Hawaii, Peru, Chile, Brazil, Ecuador, Porto Rico, San Domingo, Mexico.

This represents the largest output of the Baldwin Locomotive Works in any year of its history. The following are the figures for the production of the years 1901 to 1905, respectively:

Years.	No.	Years.	No.
1901.....	1,375	1904.....	1,485
1902.....	1,533	1905.....	2,250
1903.....	2,022		

The number of men employed by the works, exclusive of the Standard Steel Works, at this time is about 19,000. The number of working days for the year was 307.

An order for 20 engines of the De Glehn compound type for the Paris & Orleans Railway, France, has just been received. These are to be erected under rush orders and will be built entirely from French drawings and specifications, using the metric system of measurements.

The engineers and sales force of the General Fireproofing Company, comprising representatives stationed in the leading cities, held a series of meetings at the company's offices at Youngstown, Ohio, January 3 and 4. It is the intention to hold such meetings at regular intervals in the future. An incident of the past meeting was the adoption of the word Monad as the name for the General Fireproofing Company's system.

The New York Shipbuilding Company, Camden, N. J., launched on December 29 the steamship President, for the Pacific Coast Company, to be used in the passenger and freight service between San Francisco and Seattle. The vessel is 416 ft. long, 48 ft. breadth and 37 ft. deep, with a capacity of 5500 tons.

The three blast furnaces of the Carnegie Steel Company at South Sharon, Pa., made in December 40,360 gross tons of pig iron, which is a new record.

John A. Hay, of Naylor, Benzon & Co., London, Eng., is now in the United States.



## Pig Iron Production in December.

**The Output for 1906 Estimated at 25,350,000 Gross Tons.**

The coke and anthracite furnaces of the country increased their November output in December, though owing to holiday interruptions, particularly in the South, the product for the 31 days of December was not proportionately greater than that for the 30 days of November. Our returns, which are more nearly complete than in recent months, indicate a production of 2,236,153 tons of coke and anthracite iron last month, as against 2,187,665 tons in November.

It is now possible to make an estimate of the pig iron production of the United States for 1906. Allowing 210,000 tons for the output of the charcoal furnaces in the second half (the official figures for the first half being 207,722 tons) and estimating the output of a few coke furnaces, would give a total of 25,350,000 tons, which is probably within one-fifth of 1 per cent. of the official figures yet to be published.

The steel companies made a record in December with a total of 1,463,035 tons, or 11,000 tons more than the high mark reached in October. Eight furnaces were blown in in December, and the total active on January 1 was 320, as against 315 on December 1. The active capacity of coke and anthracite furnaces on January 1 was 507,397 tons, as compared with 513,860 tons on December 1. The following table gives the production of the coke and anthracite furnaces in December, as compared with the record for the preceding four months:

*Monthly Pig Iron Production.*

	August. (31 days)	September. (30 days)	October. (31 days)	November. (30 days)	December. (31 days)
New York...	138,697	140,105	139,868	134,902	135,588
New Jersey...	35,058	34,849	32,297	34,697	33,057
Lehigh Valley...	51,979	50,946	51,224	49,636	52,868
Schuylkill Val.	47,940	48,245	50,375	57,649	62,741
Lower Susquehanna and Lebanon Val.	64,145	63,968	65,231	62,016	61,481
Pittsburgh Dis.	457,002	460,903	567,662	509,211	525,312
Shenango Val.	133,984	138,843	150,019	155,698	172,161
West. Penn...	94,874	98,237	116,588	116,732	124,007
Md., Va. and Kentucky...	77,647	78,654	89,280	86,841	85,520
Wheeling Dis.	107,526	102,364	112,022	126,796	128,294
Mahoning Val.	136,415	149,635	186,983	187,261	189,238
Central and North. Ohio.	155,455	152,730	149,339	173,444	161,423
Hocking Valley and Hanging Rock	34,276	31,383	33,753	35,690	35,509
Ill., Mich., Minn., Wis., Mo. and Colo.	218,725	244,403	264,966	265,893	290,816
Alabama...	130,771	132,554	143,254	150,506	139,683
Tennessee, No. Caro., Texas and Georgia.	42,242	43,143	43,947	40,093	38,455
<b>Totals...</b>	<b>1,926,736</b>	<b>1,970,962</b>	<b>2,106,808</b>	<b>2,187,665</b>	<b>2,236,153</b>

To each of the above totals should be added about 35,000 tons, representing the monthly output of the charcoal furnaces, of which monthly statistics are not gathered.

**Production of Steel Companies.**—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

*Production of Steel Companies.—Gross Tons.*

	—Pig.—Total production.—					Spiegeleisen and ferromanganese.	
	1904.	1905.	1906.	1905.	1906.		
January	502,994	1,129,042	1,358,015	21,002	26,305		
February	756,260	1,027,937	1,226,760	22,431	26,988		
March	913,412	1,232,255	1,400,395	21,280	23,595		
April	974,006	1,222,710	1,333,591	20,038	28,054		
May	927,534	1,287,438	1,372,423	24,732	29,447		
June	788,882	1,149,404	1,293,437	21,761	22,737		

July	694,892	1,114,409	1,323,391	31,220	20,153
August	747,570	1,186,050	1,237,485	27,461	18,327
September	936,494	1,262,033	1,264,380	21,645	24,078
October	971,447	1,370,960	1,452,200	26,799	23,517
November	962,384	1,334,644	1,411,350	23,776	29,119
December	1,019,841	1,356,962	1,463,035	29,481	21,707

Among furnaces blown in in the month preceding January 1 are: Anvil in the Schuylkill Valley, one Allentown Rolling Mills stack in the Lehigh Valley, one Lucy at Pittsburgh, Hall in the Shenango Valley, Star in the Hanging Rock District, new Haselton No. 3 (Jan. 1) in the Mahoning Valley, one Sheffield Coal & Iron Company in Alabama, and Napier in Tennessee. Furnaces blown out in December include Alleghany and Buena Vista in Virginia, Benwood and Top Mill in the Wheeling District, and two Bessemer in Alabama.

The table below gives the active capacity per week of furnaces producing coke and anthracite iron on January 1, 1907, and December 1, 1906:

*Coke and Anthracite Furnaces in Blast.*

Location of furnaces.	Total number of stacks.	January 1.		December 1.	
		Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York...	13	13	24,927	13	26,281
Other New York...	10	5	5,644	5	5,596
New Jersey...	8	8	7,304	8	8,211
Spiegel	2	1	164	1	179
Pennsylvania:					
Lehigh Valley...	23	18	11,767	17	12,006
Spiegel	3	2	469	2	731
Schuylkill Valley...	13	13	14,483	12	13,451
Lower Susquehanna	8	5	5,684	5	6,384
Spiegel	1	1	693	1	674
Lebanon Valley...	10	10	7,511	10	7,952
Pittsburgh Dis.	43	41	117,903	40	115,285
Spiegel	2	2	1,799	2	1,275
Shenango Valley...	20	19	39,551	18	36,329
West. Penn.	24	20	28,007	20	27,986
Maryland	4	4	8,232	3	6,743
Spiegel	0	0	0	1	1,241
Wheeling Dis.	14	12	26,369	13	28,623
Ohio:					
Mahoning Valley...	15	18	45,549	17	43,194
Central and Northern and Michigan.	20	20	39,568	19	42,944
Hocking Valley and Hanging Rock...	12	12	8,193	11	8,211
Illinois	22	21	45,406	20	46,056
Spiegel	1	1	889	2	1,901
Minnesota	1	1	1,253	1	1,193
Wisconsin	5	5	5,232	5	5,140
Missouri	1	1	861	1	762
Colorado	4	4	7,238	4	7,666
Spiegel	1	1	628	1	247
The South:					
Virginia	23	13	8,923	14	9,925
Kentucky	7	4	2,597	4	2,774
Alabama	46	30	31,519	31	35,634
Tennessee	18	13	8,344	12	8,195
Georgia and Texas	8	2	690	2	1,071
<b>Totals...</b>	<b>380</b>	<b>320</b>	<b>507,397</b>	<b>315</b>	<b>513,860</b>

For a series of months the active coke and anthracite capacity fluctuated as follows, in gross tons:

	Capacity per week.		Capacity per week.
January 1, 1907...	507,397	June 1...	336,107
December 1, 1906...	513,860	May 1...	368,244
November 1...	500,580	April 1...	337,257
October 1...	469,665	March 1...	308,751
September 1...	441,426	February 1...	273,692
August 1...	449,908	January 1, 1904...	185,636
July 1...	460,570	December 1, 1903...	244,156
June 1...	472,622	November 1...	273,715
May 1...	484,031	October 1...	353,142
April 1...	484,240	September 1...	360,197
March 1...	479,737	August 1...	353,681
February 1...	482,156	July 1...	384,825
January 1, 1906...	463,673	June 1...	388,178
December 1, 1905...	475,814	May 1...	373,496
November 1...	460,449	April 1...	386,215
October 1...	445,468	March 1...	347,424
September 1...	412,563	February 1...	335,239
August 1...	410,088	January 1, 1903...	346,073
July 1...	408,617	December 1, 1902...	336,617
June 1...	443,092	November 1...	330,110
May 1...	452,031	October 1...	337,837
April 1...	439,564	September 1...	328,243
March 1...	403,157	August 1...	328,745
February 1...	405,792	July 1...	303,793
January 1, 1905...	377,879	June 1...	337,492
December 1, 1904...	357,846	May 1...	337,627
November 1...	334,249	April 1...	331,140
October 1...	319,249	March 1...	316,039
September 1...	291,573	February 1...	325,440
August 1...	246,092	January 1, 1902...	291,992
July 1...	272,301		



## NEWS OF THE WORKS.

### Iron and Steel.

The Firth-Stirling Steel Company, Pittsburgh, works at Demmler, Pa., has recently received a large contract from the Government for armor piercing and target shells, which amounts to nearly \$500,000. This company is erecting a large new plant near Washington, D. C., which is expected to be completed early in the new year.

New furnace distributors have been installed in a number of furnaces by Arthur G. McKee, Cleveland, Ohio, consulting and contracting engineer. Three have been put on the Central Works and one on the Emma Furnace, Newburg, of the American Steel & Wire Company; three on the furnaces of the Republic Iron & Steel Company, Birmingham, Ala.; one on the furnace of the Southern Steel Company, Gadsden, Ala.; one on the furnace of the Central Iron & Coke Company, Holt, Ala.; one on the furnace of the Penn Iron & Coke Company, Canal Dover, Ohio, and one on the furnace of the Cherry Valley Iron Company, Leetonla, Ohio.

An organization has been formed at Rusk, Texas, under the name of the Rusk Iron Company, with the following officers: W. H. Oatley, president and general manager; John S. Wightman, treasurer; Amos J. Mitchell, vice-president; V. W. Ricords, secretary and assistant general manager. Mr. Ricords is now at Rusk, directing the work of repairs, while Mr. Oatley has gone East to close contracts for coke and other supplies, and there is now every reason to look forward to the early resumption of operation of the Star and Crescent Furnace.

The Knoxville Iron Company, Knoxville, Tenn., has resumed operations after being shut down on account of shortage of coal cars. This is the fourth time that the plant has been shut down this year because of coal shortage.

The Woodward Iron Company has contracted with D. Lamond & Son, engineers, Pittsburgh, Pa., for the installation of four of the improved C. H. Foote fire brick stoves, two-pass type, 20 x 90 ft. over all, at its blast furnace plant, Woodward, Ala.

Furnace A of the Buffalo Union Furnace Company, Buffalo, N. Y., which was blown out December 10 for relining, had necessary repairs completed and was blown in again December 31, getting first iron January 1.

The Worcester Works of the American Steel & Wire Company have been put to some inconvenience by the bursting of a 24-ft. flywheel of the engine operating the rod mill at Quinsigamond. Comparatively little delay in the production of the department resulted, however, a powerful electric motor being installed to provide power during the time which will be required to replace the flywheel.

The Duplex Metals Company, New York, is devoting its entire attention to the manufacture of Monnot copper clad steel rods for wire drawing. The demand for this product has been so large that it has decided not to go into the manufacture of sheets and plates at the present time, and is removing the sheet and plate mills at its plant at Chester, Pa., for more rod mills. The company's copper clad steel wire has been most favorably received by telephone companies, who have found that a large saving can be effected over the use of pure copper wire, and that freedom from interruption of service, due to ice and sleet storms, is assured because of its greater tensile strength. Many special applications for Monnot copper clad steel have been discovered, among which is its superiority for turbine blades. The Westinghouse Machine Company has placed large orders with the Duplex Metals Company for material for turbine blading, and has secured the exclusive right in the United States for its use. The company's market wire is said to be superior to pure copper, brass and bronze for the manufacture of screens, as it affords not only the noncorrosive qualities but adds greater tensile strength and high elastic limit.

The new No. 3 Furnace of the Republic Iron & Steel Company's stacks at Hazelton, Ohio, was blown in on New Year's Day. It is a 400-ton furnace.

H. Stuart Hotchkiss and Frederick B. Farnsworth have been appointed permanent receivers of the National Wire Corporation, New Haven, Conn., and by mutual agreement they will carry on the business for at least four months, before which time it is thought a reorganization will be effected. The liabilities are placed at \$3,000,000.

In the spring a number of improvements are expected to be made to the Bessemer Furnace of the Bessemer Ferro-Silicon Company, at New Straitsville, Ohio, which will include the installation of new slag handling and conveying machinery.

Star Furnace, at Jackson, Ohio, was blown in on December 12.

The two furnaces of the Sheffield Coal & Iron Company at Sheffield, Ala., are now active. Both were idle for a portion of December.

Two furnaces of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., were banked through the holidays, and one furnace of the same company at Oxmoor.

Napier Furnace, at Napier, Lewis County, Tenn., was blown in on December 1 after repairs.

South Works Furnace No. 1 of the Illinois Steel Company blew out December 21, and No. 3 Furnace of the same group blew in on December 10.

One Allentown Rolling Mills furnace, at Allentown, Pa., blew in on December 21, after a long period of idleness.

One of the Lucy furnaces of the Carnegie Steel Company, Pittsburgh, was blown in in December after repairs.

Hall Furnace of the Republic Iron & Steel Company, at Sharon, Pa., was blown in in the third week in December.

Alleghany Furnace, Iron Gate, Va., of the Alleghany Ore & Iron Company was blown out December 24. It was expected to start again in the first week in January. Buena Vista Furnace of the same company, Buena Vista, Va., was blown out on December 20.

Benwood Furnace of the National Tube Company, at Wheeling, W. Va., was blown out for relining on December 31.

### General Machinery.

The Fawcett Machine Company, Pittsburgh, maker of cut gears, has just completed building the operating machinery for the Anacostia four-track bascule bridge, near Washington, D. C. During the past year the company operated its plant 22 hours per day and added new machinery that more than doubled its output. It entered the new year with a very large number of orders on its books and expects to operate its plant night and day for some months to come.

J. P. Westerberg, Wannersburg, Kan., will erect a machine shop at Savenburg and have it ready for operation by the middle of February. P. Ahlund will have charge of the woodworking department.

The Riehle Bros. Testing Machine Company, Philadelphia, Pa., has been awarded the contract by the Bureau of Surveys of Philadelphia for a compression testing machine of 1,000,000 lb. capacity. It is to be installed in the testing laboratory for making compression tests of building material, concrete, &c.

Owing to the rapid growth of its business the Brown Clutch Company, Elyria, Ohio, has increased its capital stock from \$35,000 to \$100,000, and will build a machine shop 60 x 150 ft. to manufacture friction clutches of all kinds. Considerable machinery will be purchased in the near future.

The Excelsior Steel Ball Company, Buffalo, N. Y., is adding to its plant a forge and machine shop 50 x 137 ft., with an L 40 x 90 ft., of concrete block construction. Upon its completion the company will replace three of the older buildings of the plant with concrete fireproof structures.

The Coffeyville Machine Shop & Foundry Company, Coffeyville, Kan., whose incorporation was previously noted, has awarded contracts for three buildings, respectively 60 x 100 ft., 48 x 100 ft., and 40 x 45 ft. These buildings are extensions to the foundry and machine shops of the present plant.

The Milwaukee Refrigeration Transit Company, Milwaukee, Wis., has purchased a piece of land upon which it intends to erect shops for repair work and possibly for the construction of new cars. No plans have been prepared for the new buildings, and it may be some time before construction work is started.

The Watervliet Forge, Watervliet, N. Y., recently incorporated, has taken over a plant where it will manufacture iron and steel forgings of every description. A. L. Kelly is president, John F. Kelly vice-president, and John H. McMahan secretary.

Some iron working machinery will be purchased in the spring by the 1000 Island Boat & Engine Company, Morristown, N. Y., which is erecting new buildings and installing new equipment for the manufacture of boats and engines. Most of the equipment has been purchased. The company is a consolidation of the business of G. I. Lloyd, Syracuse, engine builder; the Donald Boat Mfg. Company, Morristown, and L. C. Jackson, Ogdensburg, boat builder. G. I. Lloyd is president, J. H. Donald vice-president, and M. N. Donald secretary-treasurer.

The Piqua Blower Company is being incorporated with a capital stock of \$50,000 to take over the interests of the Piqua Foundry & Machine Company, Piqua, Ohio, and will make a specialty in the manufacture of positive blowers and gas exhausters, developed by the latter company in the past two years. The success which this machinery has met necessitated a reorganization in order to take care of the large volume of business offered.

The Atlas Drop Forge Company, Lansing, Mich., organized in November with a capital stock of \$100,000, has completed its new buildings, which it expects to have ready for operation by April 1. The equipment orders, which have already been placed, will embody the most modern improved appliances for the manufacture of high class forgings. A specialty will be made of forged parts for automobiles, gas engines, &c., and particular attention will be given to the making of large single and multiple throw cranks, weighing from 10 to 400 lb. All iron and steel will be worked according to its chemical analysis and scientifically treated to relieve it from strains resulting from the high heats in forging. It is claimed that this treatment increases tensile strength 25 per cent. S. H. Carpenter is manager, and H. W. Bundy, who has had long experience in the forging business, having been connected with the Springfield Drop Forge Company, Wyman & Gordon and others, is secretary.

The Bates Forge Company, Indianapolis, Ind., manufacturer of drop forged flange wheels, has moved into its new buildings, where with new hammers and tools the company will have double the capacity of the old shop, thus enabling it to take care of its increased trade.

#### Power Plant Equipment.

The Middleville Electric Light Company, Middleville, N. Y., has inquiries in the market for two 75 kw. generators, for improvements the company is making to its plant.

The business of the West Haven Motor Company, West Haven, Conn., manufacturer of combustion engines, which has been conducted by I. A. Watrous, has been incorporated with a capital stock of \$5000. The incorporators are Isaac A. Watrous, George B. Watrous and William L. Knapp, all of West Haven.

The Danbury & Bethel Gas & Electric Light Company, Danbury, Conn., will ask the Connecticut Legislature for permission to increase its capital \$175,000, with the purpose of carrying out extensive enlargements and improvements.

The Oswald Company, Goshen, Ind., has been incorporated with \$10,000 capital to engage in the manufacture of gas engines, and will equip the factory building now being vacated by the Specialty Case Company. Officers have been elected as follows: Elmer Newell, president; W. T. Miller, vice-president; O. M. Curtis, treasurer and general manager; Charles Shoup, secretary, and J. W. Oswald, superintendent.

The Crescent Rotary Engine Company, Salina, Kan., has been chartered with a capital stock of \$30,000. A factory has been secured, which will be in operation shortly.

The Lazier Gas Engine Company, Buffalo, N. Y., has been organized for the manufacture of large multiple cylinder gas engines for electric light and power use, also in connection with producer gas. In addition a large line in medium sized horizontal engines will be manufactured. The company operates a \$400,000 plant, but will likely build in the near future. A. A. Lazier is president, J. M. Williams vice-president, and L. W. Lazier secretary-treasurer.

The General Fireproofing Company, Youngstown, Ohio, has recently placed contracts for 400-hp. boiler and 20 x 24 in. stationary engine, 200-kw. generator direct current, and a 10-ton crane with 95-ft. span.

#### Foundries.

The Menzel & Jeffrey Company, Minneapolis, Minn., has been organized and has taken over the foundry of Menzel & Jeffrey. The capital stock authorized is \$100,000, and the incorporators are Charles G. Menzel, J. Arthur Jeffrey, Thomas Mulcahy and R. J. Smith.

A large foundry with modern equipment will be erected soon in Alliance, Ohio, if the plans of Fred Baugh, a pioneer foundryman, are carried out. It is proposed early in 1907 to organize the Baugh Foundry Company to take over Mr. Baugh's foundry as a nucleus. Mr. Baugh's business has outgrown his present quarters.

The McMinnville Foundry & Machine Works, McMinnville, Tenn., has changed hands. David M. Wrightman & Son have bought the stock and business.

For the third time within a year the Ross-Meehan Foundry Company, Chattanooga, Tenn., is making an addition to its plant. A new pattern shop has now been commenced. It will be 60 x 200, built of brick and steel on a concrete foundation.

Gustaf C. Hoglund and Edward G. Watkins, Gardner, Mass., proprietors of the General Foundry Company of that place, have purchased the foundry recently operated under the name of the Gardner Foundry Company and owned by C. H. Kenson and Eugene S. Nichols. The Gardner Foundry will be operated under the same name, in connection with the business of the General Foundry Company, and under the management of Mr. Hoglund, assisted by Messrs. Kenson and Nichols, the former owners.

The Cleveland Foundry Company, Cleveland, Ohio, manufacturer of stoves for the Standard Oil Company, is erecting an addition to its factory 50 x 180 ft., two stories high, of brick, steel and wood construction. No additional machinery will be purchased.

The Standard Foundry & Mfg. Company, Cleveland, Ohio, has just completed a 125-ft. addition to its molding room. This company reports a heavy demand for castings and that it is 30 days behind in its orders for steel ranges.

The malleable foundry of the Terre Haute Malleable & Mfg. Company, Terre Haute, Ind., which was recently built, made its first cast on December 20. It is equipped with one 12-ton furnace, and its ovens have a capacity of 22 tons. Hardware specialties, as well as miscellaneous malleable castings, will be manufactured. A. W. Wagner is president and H. J. Wagner secretary and treasurer.

The jobbing foundry business of Walker & Shultz, Lansing, Mich., has been incorporated under the firm name of Walker & Shultz Foundry Company, with a capital of \$5000. The incorporators are Wm. Walker, Adolph Shultz, Julius Shultz and Otto Lietzau, Jr.

The Allyne Brass Foundry Company, recently incorporated with a capital stock of \$50,000, has taken over the plant of the Liberty Brass Foundry, Buffalo, N. Y., which will be enlarged.

The company is closely connected with the Allyne Brass Foundry, Detroit, Mich., and the Allyne Brass Foundry, Cleveland, Ohio, in the manufacture of aluminum, brass and various grades of bronze castings of every description. Edmund E. Allyne is president and general manager.

The D. & W. Fuse Company, Providence, R. I., is to erect a new foundry building, 38 x 69 ft. The foundry equipment will include Steele-Harvey and Schwartz oil burning furnaces, the intention being to use fuel oil, and sand blast for cleaning castings.

The Racquette Foundry & Supply Company, Pottsdam, N. Y., is to erect and equip a new foundry and machine shop at Messena, N. Y., for doing job work and building special machinery. Plans for the new structures are now being prepared. The Pottsdam Foundry & Machine Company has been organized to take over and carry on the business of the former company at Pottsdam after it has moved to its new plant in Messena. This removal will take place in about six months. G. D. Huntington is president and G. S. Knowlton vice-president of the Racquette Foundry & Supply Company, while R. S. Rivers is president and F. F. Noone vice-president of the Pottsdam Foundry & Machine Company. A. R. O'Neill is secretary of both companies.

#### Bridges and Buildings.

The Western Bridge & Construction Company, Omaha, Neb., has been incorporated with a capital of \$75,000, to engage in the construction of highway and railroad bridges, and a specialty will be made of concrete and metal structures, pile driving and all kinds of foundation work. F. J. Birss, John W. Towle, R. A. Swartout and H. W. Anderson are the incorporators.

The Bartlett Steel Company, Joplin, Mo., has been succeeded by the Southwestern Bridge Company, the change merely being made to provide increased capital and to secure a broader charter. The management, however, will remain in the same hands. The company has a capital of \$100,000 and has an annual capacity of 12,000 tons of fabricated structural material. J. K. Wingert is president, A. Baker vice-president, E. J. Tutty secretary, T. Sawyer treasurer and H. W. Klare general manager.

The Van Dorn Iron Works Company, Cleveland, Ohio, reports that inquiries for structural material for early delivery next season are very numerous and that it has not figured on all of the jobs offered. The company now has orders for April and May deliveries.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, is extending its main erecting shop with an addition 100 x 105 ft. No machinery will be installed with the exception of necessary hoists, which have already been purchased.

The plant of the Bellefontaine Bridge & Iron Company, Bellefontaine, Ohio, has been purchased at auction by John West, representing the Bellefontaine Bridge & Steel Company, a new organization, for \$25,000. The merchandise, contracts, &c., valued at about \$8000, will be offered at private sale.

#### Fires.

The plant of the National Biscuit Company, New York, was destroyed by fire December 29, the loss being placed at nearly \$300,000.

The Philadelphia Strawboard Company's plant at Philadelphia was destroyed by fire December 27, the loss being about \$50,000.

The main building of the Philip Carey Mfg. Company's plant at Lockland, a suburb of Cincinnati, Ohio, was burned December 31, the loss being about \$30,000.

The plant of the Delaware Barytes & Chemical Company at Newport, Del., was destroyed by fire January 4. The loss is placed at \$50,000.

The plant of the Columbus Chain Company, Columbus, Ohio, was damaged to the amount of \$35,000 by fire on January 5. Three shops were destroyed.

A large part of the plant of the Michigan Stove Works, Detroit, Mich., was burned January 8. The loss is placed at over \$200,000.

#### Hardware.

Arcade Mfg. Company, Freeport, Ill., has doubled the capacity of its plant during the past year and contemplates some further additions.

The jack screw and skein finishing departments of the American Skein & Foundry Company, Racine, Wis., were destroyed by fire on December 23. The roof of the foundry was also slightly damaged, but repairs have already been made and operations resumed. The skein finishing department has been installed in an adjoining warehouse, and work was resumed on January 7, while preparations are being made to resume operations in the jack screw department, and the company states that it will be ready to make deliveries within 10 days. Although the fire was severe, nevertheless manufacturing operations will not be greatly interfered with, and deliveries will be hurried forward as speedily as possible.

The Independent Casket Hardware Company has been organized at Galesburg, Ill., with a capital of \$10,000, to engage in the manufacture of casket trimmings. A plant is now being equipped and operations will shortly be commenced. W. B. Horton has been elected president; W. S. Marriott, vice-president, and J. P. Foley, secretary and treasurer.



## The Iron and Metal Trades

The monthly Pig Iron statistics collected by *The Iron Age* show that the output of the Coke and Anthracite furnaces was 2,236,153 gross tons in December, as compared with 2,187,665 tons in November. The production of the Steel works furnaces has broken all records, having reached 1,463,035 tons in December. However, the outlook for maintaining the December output during the current month is not very promising, since the capacity of the furnaces in operation declined from 513,860 tons per week on December 1 to 507,397 tons per week on January 1, 1907.

Scarcity of Spot Iron is still a marked feature in all the leading Pig Iron markets, and promises to continue so for some time unless weather conditions are very favorable and transportation facilities improve very materially. The majority of buyers continue to have a good deal of confidence in the second half of the year, but it is only fair to state that an increasing number of consumers have determined to await developments, in view of the high prices prevailing. Sellers generally are very firm, but there are instances cropping up of inducements being made to book orders for delivery during the second half.

In the Central West some pretty large orders for Foundry Iron will probably be placed at an early date, this including 15,000 tons for a Pipe founder and 10,000 tons for a machinery manufacturer. The negotiations for a large tonnage for an agricultural implement interest have not yet come to a head. In the East there have been some additional large sales of Basic Iron at high prices, but otherwise Pig Iron consumers are growing conservative as to forward deliveries.

In some quarters specifications for Structural Shapes are not coming in fast enough to employ the full capacity of the mills, thus affording a welcome opportunity to divert the Steel into other channels. The Eastern Plate makers have advanced prices \$2 per ton.

A moderate amount of structural work has been placed, this including 8000 tons of bridge work for the New York Central, and 1500 tons for the Louisville & Nashville road.

An interesting transaction is the sale of a 5000-ton lot of Steel Bars for a reinforced concrete building for a Chicago catalogue house. This is the largest contract for concrete bars yet placed.

LATER.—A heavy buying movement in Pig Iron for last half delivery has started at Pittsburgh. Large tonnages of Bessemer, Basic and Foundry Iron have been taken by important consuming interests.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 9, 1907.	Jan. 2, 1907.	Dec. 12, 1906.	Jan. 10, 1906.
<b>PIG IRON, Per Gross Ton:</b>				
Foundry No. 2, Standard, Philadelphia .....	\$25.50	\$25.75	\$24.50	\$18.50
Foundry No. 2, Southern, Cincinnati .....	26.00	26.00	25.00	18.75
Foundry No. 2, Local, Chicago ..	25.50	25.50	25.50	19.25
Bessemer, Pittsburgh .....	23.35	23.35	23.85	18.35
Gray Forge, Pittsburgh .....	22.85	22.85	22.85	17.25
Lake Superior Charcoal, Chicago ..	27.00	26.00	26.00	20.50
<b>BILLETS, &amp;c., Per Gross Ton:</b>				
Bessemer Billets, Pittsburgh ..	29.50	29.50	29.50	26.00
Forging Billets, Pittsburgh ..	36.50	36.50	36.50	30.00
Open Hearth Billets, Phila. ....	33.00	34.00	33.00	30.00
Wire Rods, Pittsburgh .....	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill ..	28.00	28.00	28.00	28.00
<b>OLD MATERIAL, Per Gross Ton:</b>				
O. Steel Rails, Chicago .....	18.00	18.00	20.50	16.50
O. Steel Rails, Philadelphia ..	18.75	20.00	20.00	18.25
O. Iron Rails, Chicago .....	28.00	28.00	28.00	23.00
O. Iron Rails, Philadelphia ..	27.50	27.75	27.75	24.50
O. Car Wheels, Chicago .....	25.00	25.00	25.00	19.00
O. Car Wheels, Philadelphia ..	23.00	23.00	23.00	18.75
Heavy Steel Scrap, Pittsburgh ..	19.00	20.00	20.00	17.50
Heavy Steel Scrap, Chicago ..	17.00	17.00	17.50	15.00
<b>FINISHED IRON AND STEEL,</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia ..	1.88½	1.88½	1.83½	1.83½
Common Iron Bars, Chicago ..	1.81½	1.81½	1.71½	1.85
Common Iron Bars, Pittsburgh ..	1.80	1.80	1.80	1.90
Steel Bars, Tidewater, New York ..	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh .....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York ..	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh .....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York ..	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh .....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York ..	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh .....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh ..	1.65	1.65	1.65	1.55
Skelp, Sheared Steel, Pittsburgh ..	1.70	1.70	1.70	1.65
<b>SHEETS, NAILS AND WIRE,</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh .....	2.50	2.50	2.50	2.30
Wire Nails, Pittsburgh .....	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh .....	2.05	2.05	2.05	1.75
Barb Wire, Galv., Pittsburgh ..	2.45	2.45	2.45	2.30
<b>METALS, Per Pound:</b>				
Lake Copper, New York .....	24.25	23.75	23.00	19.00
Spelter, St. Louis .....	6.00	6.55	6.50	6.45
Lead, New York .....	6.30	6.30	6.12½	5.95
Lead, St. Louis .....	6.10	6.05	5.92½	6.00
Tin, New York .....	41.55	41.85	42.85	36.50
Antimony, Hallett, New York ..	25.00	25.00	25.00	14.25
Nickel, New York .....	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York .....	\$4.00	\$4.09	\$4.09	\$3.69

## Chicago.

FISHER BUILDING, January 9, 1907.

The decline in the demand for Structural Material and the falling off in the volume of specifications on existing contracts have resulted in the shutting down of the 35-in. mill of the Carnegie Steel Company and the operation of the Structural mill of the Illinois Steel Company on Billets during alternate weeks. While there is customarily a shrinkage in requirements in the winter season, nevertheless the tremendous increase in output in the last 12 months has been a potent factor in the development of the present situation. With the resumption of building operations in the spring a big increase in consumption is anticipated, although contemplated work in this district does not compare favorably with that under way a year ago. All other lines of finished materials are in heavy demand, and specifications continue to exceed the producing capacity. An order for 5000 tons of Steel Bars placed with local mills, to be used for the concrete reinforcement of a large warehouse, indicates the extensive replacement of Shapes by this form of construction. Accumulated specifications at the mills of the Illinois Steel Company show no decline, although the diversion of Steel from the Structural mill will materially increase the output of other departments which have suffered from an inadequate supply. Premiums of \$1 a ton are being secured on the heavier gauges of Sheets, and deliveries cannot be made in less than three or four months. Further advances have been recorded in Pig Iron for early delivery, and the anxiety displayed by consumers in their future supply portends the placing of a large tonnage within the next few weeks. That municipalities, railroads and water works have concluded to defer improvements on account of the high prices prevailing for Cast Iron Pipe is indicated by the almost entire absence



of inquiry from these sources. Most of the foundries have concluded shipments on contracts placed last year, and are making up stocks for the spring trade, which does not promise to be of abnormal proportion from present indications.

**Pig Iron.**—Inquiry for iron for second half delivery is heavy and large tonnages will be placed before the end of the week. One Cast Iron Pipe interest is asking for quotations on 15,000 tons, while the Allis-Chalmers Company, Milwaukee, will close for at least 10,000 tons. Other buyers are negotiating for lots ranging from 1000 to 3000 tons for shipments extending through the second and third quarters, and the volume of inquiry for February and March is indicative of low stocks in Foundry yards throughout this district. For iron in transit \$24, Birmingham, is asked for No. 2, and for shipment the remainder of the first quarter \$23 is the minimum. The schedule for the second quarter has been again advanced, and is now on a basis of \$26.35, Chicago, for No. 2, while for the third and fourth quarters quotations range from \$22.85 to \$23.35. Malleable Bessemer for the last half has sold at \$22.50 to \$23, Chicago, and Northern operators are quoting the same for No. 2. Lake Superior Charcoal in car lots has been sold at \$28.50 for spot delivery, although the bulk of the current business is being closed at \$27 to \$27.50. Ohio and Kentucky Silveries have again advanced and are scarce even at these prohibitive prices. An improvement in shipments from Southern furnaces is reported although the car shortage locally is still acute. Quotations for February and March shipments, f.o.b. Chicago, including the 45c. advance in freight rates on Southern grades are as follows:

Lake Superior Charcoal.....	\$27.00 to \$27.50
Northern Coke Foundry, No. 1.....	26.00 to 26.50
Northern Coke Foundry, No. 2.....	25.50 to 26.00
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	27.35 to 27.85
Southern Coke, No. 2.....	26.85 to 27.35
Southern Coke, No. 3.....	26.35 to 26.85
Southern Coke, No. 4.....	25.85 to 26.35
Southern Coke, No. 1 Soft.....	27.35 to 27.85
Southern Coke, No. 2 Soft.....	26.85 to 27.35
Southern Gray Forge.....	23.35 to 23.85
Southern Mottled.....	22.85 to 23.35
Malleable Bessemer.....	26.00 to 26.50
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	23.30 to 23.80
Jackson Co. and Kentucky Silvery, 8 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 10 %	32.30 to 32.80

**Metals.**—Further advances have been recorded in Copper, the upward movement of prices continuing without a halt. Local stocks have been practically depleted, and consumers are buying to cover their immediate requirements. We revise quotations as follows: Casting Copper, 26 $\frac{1}{4}$ c. to 26 $\frac{3}{4}$ c.; Lake, 26 $\frac{1}{4}$ c. to 27 $\frac{1}{4}$ c., in car lots for prompt shipment; small lots,  $\frac{1}{4}$ c. to  $\frac{3}{4}$ c. higher; Pig Tin, car lots, 44 $\frac{1}{4}$ c.; small lots, 44 $\frac{1}{4}$ c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 6.88c.; Cookson's Antimony, 28 $\frac{1}{4}$ c., and other grades, 26 $\frac{1}{2}$ c. to 27 $\frac{1}{2}$ c.; Sheet Zinc is \$8.25 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 20 $\frac{1}{2}$ c.; Heavy Copper, 20 $\frac{1}{4}$ c.; Copper Bottoms, 19 $\frac{1}{2}$ c.; Copper Clips, 20c.; Red Brass, 19 $\frac{1}{2}$ c.; Red Brass Borings, 16 $\frac{1}{4}$ c.; Yellow Brass, 16c.; Yellow Brass Borings, 14 $\frac{1}{4}$ c.; Light Brass, 12 $\frac{3}{4}$ c.; Lead Pipe, 5.50c.; Tea Lead 5c.; Zinc, 5c.; Pewter, No. 1, 28c.; Tin Foil, 34c.; Block Tin Pipe, 27 $\frac{1}{2}$ c.

**Cast Iron Pipe.**—That public improvements are being deferred, owing to the high prices which are prevailing, is indicated by an almost entire absence of inquiries at a time when the buying movement should be at its height. All of the foundries are in position to make prompt shipments, and are now working on stocks for the spring trade. We quote: Water Pipe, 4 in., \$37 to \$38; 8, 8, 10 and 12 in., \$36 to \$37; over 12 in., \$35 to \$36, with \$1 extra for Gas Pipe.

(By Mail.)

**Billets and Rods.**—The operation of the Structural mill of the Illinois Steel Company on Billets during alternate weeks until Shape specifications improve, has increased the Steel supply for the company's other finishing departments, although the tonnage for the open market has not been added to. Forging Billets are still in demand at prices ranging from \$38 to \$46, according to quality. Rods continue scarce and unchanged at \$41, f.o.b. Chicago.

**Rails and Track Supplies.**—For immediate shipment in small lots the Pennsylvania Steel Company is asking \$30, f.o.b. Steelton, for Standard Section Rails, although no sales have been reported on this basis. Other Rail makers, however, are maintaining the official price for 1907 shipment, regardless of the time of delivery. Light Rails are in heavy demand, but quotations are unchanged. We quote: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.60c.; Spikes, 2.25c. to 2.50c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base. Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$33; 25-lb., \$34; 20-lb., \$33; 16-lb.,

\$36; 12-lb., \$37, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—Owing to the decline in the volume of Shape specifications, the Illinois Steel Company is rolling Billets on its Structural mill alternate weeks. The Carnegie Steel Company has shut down its 35-in. mill temporarily, and the Steel is being diverted to other departments. Although the falling off in demand is seasonable, nevertheless the present condition of the market is largely attributed to the tremendous increase in the producing capacity made in the last two years. The contract for the Steel for the new power house of the Chicago & Milwaukee Electric Railway Company, amounting to 2500 tons, was awarded to the South Halsted Street Iron Works. Store quotations are unchanged at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86 $\frac{1}{2}$ c.; Angles, 3 to 6 in.,  $\frac{1}{4}$ -in. and heavier, 1.86 $\frac{1}{2}$ c.; larger than 6 in. on one or both legs, 1.96 $\frac{1}{2}$ c.; Beams, larger than 15 in., 1.96 $\frac{1}{2}$ c.; Zees, 3 in. and over, 1.86 $\frac{1}{2}$ c.; Tees, 3 in. and over, 1.91 $\frac{1}{2}$ c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

**Plates.**—Current Plate tonnage is now almost entirely being placed with Eastern mills at prices ranging from 1.80c. to 1.90c., Pittsburgh. This year's output of the Illinois Steel Company has already been sold, and considerable business has been transferred to the Carnegie Steel Company. We quote for future delivery: Tank Plates,  $\frac{1}{4}$ -in. and heavier, wider than 6 $\frac{1}{4}$  and up to 100 in. wide, inclusive, car lots, Chicago, 1.76 $\frac{1}{2}$ c. to 1.86 $\frac{1}{2}$ c.; 3-16-in., 1.86 $\frac{1}{2}$ c. to 1.96 $\frac{1}{2}$ c.; Nos. 7 and 8 gauge, 1.91 $\frac{1}{2}$ c. to 2.01 $\frac{1}{2}$ c.; No. 9, 2.01 $\frac{1}{2}$ c. to 2.11 $\frac{1}{2}$ c.; Flange quality, in widths up to 100 in., 1.86 $\frac{1}{2}$ c. to 1.96 $\frac{1}{2}$ c., base, for  $\frac{1}{4}$ -in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86 $\frac{1}{2}$ c. to 1.96 $\frac{1}{2}$ c.; Flange quality, 1.96 $\frac{1}{2}$ c. Store prices on Plates are as follows: Tank Plate,  $\frac{1}{4}$ -in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16-in., up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8 up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

**Bars.**—Contracts for 5000 tons of Steel Bars, to be used in the erection of the new concrete warehouse of Montgomery Ward & Co., this city, have been placed with local mills. This is the largest order for concrete Bars for a single building ever placed, and is indicative of the rapid replacement of Structural material by this type of construction. Iron Bars, although usually held at 1.81 $\frac{1}{2}$ c., Chicago, can still be shaded \$1 a ton on desirable orders. Current business is heavy, and shipments of Steel Bars from Milwaukee will be increased by the Illinois Steel Company, as Billet deliveries from the South Works have been increased. Quotations are unchanged, as follows: Iron Bars, 1.81 $\frac{1}{2}$ c. to 1.86 $\frac{1}{2}$ c.; Steel Bars, 1.76 $\frac{1}{2}$ c., both half extras; Hoops, 2.16 $\frac{1}{2}$ c., extras as per Hoop card; Bands, 1.76 $\frac{1}{2}$ c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.66 $\frac{1}{2}$ c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

**Sheets.**—Premiums of \$1 a ton are being asked on the heavier gauges, while on the lighter sizes none of the mills is in position to make deliveries in less than three months. Current business is heavy, and stocks throughout this district are light. We quote: Blue Annealed, No. 10, 1.96 $\frac{1}{2}$ c.; No. 12, 2.01 $\frac{1}{2}$ c.; No. 14, 2.06 $\frac{1}{2}$ c.; No. 16, 2.16 $\frac{1}{2}$ c.; Box Annealed, Nos. 17 to 21, 2.51 $\frac{1}{2}$ c.; Nos. 22 to 24, 2.56 $\frac{1}{2}$ c.; Nos. 25 and 26, 2.61 $\frac{1}{2}$ c.; No. 27, 2.66 $\frac{1}{2}$ c.; No. 28, 2.76 $\frac{1}{2}$ c.; No. 29, 2.86 $\frac{1}{2}$ c.; No. 30, 2.96 $\frac{1}{2}$ c.; Galvanized Sheets, Nos. 10 to 14, 2.71 $\frac{1}{2}$ c.; Nos. 15 and 16, 2.91 $\frac{1}{2}$ c.; Nos. 17 to 21, 3.06 $\frac{1}{2}$ c.; Nos. 22 to 24, 3.21 $\frac{1}{2}$ c.; Nos. 25 and 26, 3.41 $\frac{1}{2}$ c.; No. 27, 3.61 $\frac{1}{2}$ c.; No. 28, 3.81 $\frac{1}{2}$ c.; No. 30, 4.31 $\frac{1}{2}$ c.; Sheets from store, Blue Annealed, No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store, Nos. 10 to 20, 3.20c. to 3.25c.; Nos. 22 to 24, 3.45c. to 3.50c.; No. 26, 3.55c. to 3.60c.; No. 27, 3.65c. to 3.85c.; No. 28, 4c.; No. 30, 4.55c. to 4.60c.

**Merchant Steel.**—There has been no decline in the volume of specifications from Western implement makers, whose plants are operating in full to meet the demands of the dealers for the spring trade. While the mills will book contracts for last half delivery they are not seeking tonnage for this period, and practically no business has thus far been placed. Quotations are unchanged, as follows: Flanished or Smooth Finished Tire Steel, 1.96 $\frac{1}{2}$ c.; Iron Finish, up to 1 $\frac{1}{2}$  x  $\frac{1}{2}$  in., 1.91 $\frac{1}{2}$ c.; Iron Finish, 1 $\frac{1}{2}$  x  $\frac{1}{2}$  in. and larger, 1.76 $\frac{1}{2}$ c., base; Channels for solid rubber Tires,  $\frac{3}{4}$  to 1 in., 2.26 $\frac{1}{2}$ c., and 1 $\frac{1}{4}$ -in. and larger, 2.16 $\frac{1}{2}$ c.; Smooth Finished Machinery Steel, 2.01 $\frac{1}{2}$ c.; Flat Sleigh Shoe, 1.71 $\frac{1}{2}$ c.; Concave and Convex Sleigh Shoe, 2.06 $\frac{1}{2}$ c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.31 $\frac{1}{2}$ c.; Railroad Spring, 1.96 $\frac{1}{2}$ c.; Crucible Tool Steel, 6 $\frac{1}{2}$ c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

**Merchant Pipe.**—Mill shipments continue to be deferred, and stocks throughout this section are consequently light. Current demand is abnormally heavy for this season, as building operations are being carried on without interruption owing to the favorable weather. Discounts on car lots, Chicago, are as follows: Black Steel Pipe, 75.35 on the base sizes,  $\frac{3}{4}$  to 6 in., and Galvanized, 65.35. From store in small lots Chicago jobbers quote 72½ to 73 per cent. on Black Steel Pipe,  $\frac{3}{4}$  to 6 in. Iron Pipe is held at an advance of four to five points above these prices.

**Boiler Tubes.**—As on Pipes, shipments are deferred from 30 to 60 days, although jobbers' stocks are sufficiently large to provide for the current demand. Mill quotations are as follows on the base sizes, 2½ to 5 in., in carload lots: Steel Tubes, 66.35; Iron, 53.35; Seamless, 50.35; 2½-in. and smaller, and lengths over 18 ft., and 2½-in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are, however, unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.....	40	35	42½
1½ to 2 in.....	50	35	35
2 to 2½ in.....	52½	35	30
2½ to 3 in.....	60	47½	42½
3 to 5 in.....	50	35	..
6 in. and larger.....	50	35	..

**Coke.**—Shipments of Foundry Coke from the Pocahontas field have almost ceased, many operations in that field having been compelled to shut down owing to the car shortage. Occasional car lots of 72-hour Connellsville Coke are selling on the basis of \$4.25 to \$4.50 at the ovens, and By-Product is quoted at \$7.40, f.o.b. Chicago, for prompt delivery.

**Old Material.**—Offerings of Dealers' Forge are heavy and prices have declined 50c. a ton. Dealers are also disposing of their accumulated stocks of Wrought Scrap, although railroad grades, while slightly weaker, have not declined below \$16.75 per ton. Notwithstanding the recent heavy sales, the downward movement of the market was not as rapid as generally anticipated, and the fact that many interests have replenished their stocks would indicate that much lower values are not expected to prevail. The Wisconsin Central and the Chicago & Northwestern railroads disposed of 1400 tons last week, and the Santa Fé and Baltimore & Ohio railroads will close on 4000 tons next week. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails.....	\$28.00 to \$29.00
Old Steel Rails, 4 ft. and over.....	19.00 to 19.50
Old Steel Rails, less than 4 ft.....	18.00 to 18.50
Heavy Relaying Rails, subject to inspection, 50 lb. and under.....	31.00 to 32.00
Old Car Wheels.....	25.00 to 25.25
Heavy Melting Steel Scrap.....	17.00 to 17.50
Frogs, Switches and Guards.....	18.00 to 18.50
Mixed Steel.....	15.00 to 15.50

The following quotations are per net ton:

Iron Fish Plates.....	\$23.00 to \$23.50
Iron Car Axles.....	27.50 to 28.00
Steel Car Axles.....	23.50 to 24.00
No. 1 Railroad Wrought.....	16.75 to 17.25
No. 2 Railroad Wrought.....	15.75 to 16.25
Railway Springs.....	16.00 to 16.50
Locomotive Tires, smooth.....	16.00 to 16.50
No. 1 Dealers' Forge.....	13.00 to 13.50
Mixed Bushelling.....	12.00 to 12.50
Iron Axle Turnings.....	11.00 to 11.50
Soft Steel Axle Turnings.....	11.00 to 11.50
Machine Shop Turnings.....	11.00 to 11.50
Cast Borings.....	9.00 to 9.50
Mixed Borings, &c.....	9.00 to 9.50
No. 1 Mill.....	10.50 to 11.00
No. 2 Mill.....	9.50 to 10.00
No. 1 Boilers, cut to Sheets and Rings.....	12.00 to 12.50
No. 1 Cast Scrap.....	18.00 to 18.50
Stove Plate and Light Cast Scrap.....	14.00 to 14.50
Railroad Malleable.....	17.50 to 18.00
Agricultural Malleable.....	16.00 to 16.50

## Birmingham.

BIRMINGHAM, ALA., January 6, 1907.

**Pig Iron.**—Market conditions remain about the same as last week, with prices unchanged. Sales of several thousand tons for delivery during the last half are reported, and some big deals are still pending. Inquiries cover every delivery from spot to last quarter, and one large consumer is asking for prices extending into 1908. The amount of future business which has been booked by the different producers in the district varies considerably, one of the largest interests here stating that it has only 30,000 tons of all grades of Foundry Iron for shipment in the last six months and none at all for delivery in the first half, while others have booked practically nothing for last half of the year. An improvement in the car situation is one of the things promised for the near future. The railroads state that a large percentage of the cotton crop has now been moved, and the cars heretofore in that service will soon be brought to this district. All the furnaces that were banked during the holidays are again in operation, and everything points toward a record breaking production this year. The furnace which the Alabama Consolidated Coal & Iron Company has just completed at Gadsden will soon be started. It is also expected that one stack of the Woodstock Iron Company will be ready for blast by March, as every effort is being made to rush the necessary repair work as fast as possible. Good progress is being made on the new furnace which the Birmingham Iron Company is building, though it is not expected that this

will be finished before September. The labor situation is the only serious handicap to the successful operation of the furnaces here, and if this can be overcome by immigration the new stacks built and the old ones which have been placed in operation should easily increase the output of this district by 1000 tons per day over that of last year.

The advance of 50c. per ton in the freight rate on Pig Iron and Cast Iron Pipe to Missouri River points, which was to have gone into effect January 1, has been indefinitely postponed. This territory will, however, be affected by the general advance of 25c. per ton beginning February 1.

**Cast Iron Pipe.**—Consumers have come to the conclusion that it is useless to wait longer to place orders for Pipe and are now making contracts freely at prevailing prices. Few of the foundries here have anything to offer for delivery before April, and on smaller sizes are sold up for the next six months. The letting which is attracting most attention now is the one by the city of New Orleans on the 25th. This will be for 37,000 tons of Pipe and Specials, and delivery will cover 26 months. Just how to buy Iron for this contract is giving the manufacturers much concern at present. Quotations on Water Pipe remain unchanged and the market is firm at the following prices: 4 to 6 in., \$35; 6 to 12 in., \$33; over 12-in., average \$30, with \$1 per ton extra for Gas Pipe.

**Old Material.**—The market is in good condition, with small stocks on dealers' yards and prices being maintained. Quotations have been revised and are about as follows per gross ton, f.o.b. cars dealers' yards:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	19.50 to 20.00
Old Steel Axles.....	17.50 to 18.50
Old Car Wheels.....	19.50 to 20.00
No. 1 Railroad Wrought.....	20.00 to 20.50
No. 2 Railroad Wrought.....	15.50 to 16.00
No. 1 Country Wrought.....	15.50 to 16.00
No. 2 Country Wrought.....	12.50 to 13.00
Wrought Pipe and Flues.....	13.00 to 13.50
Railroad Malleable.....	14.00 to 14.50
No. 1 Steel.....	15.00 to 15.50
No. 1 Machinery Cast.....	16.25 to 16.75
Stove Plate and Light Cast.....	12.00 to 12.50
Cast Borings.....	8.75 to 9.25

The Charcoal furnace of the Rock Run Furnace Company, at Rock Run, Ala., which is owned by the Bass Foundry & Machine Company, will close down for repairs in the near future. This is one of the oldest stacks in the State and has a record of never having stopped except for repairs.

## Philadelphia.

PHILADELPHIA, PA., January 8, 1907.

The Iron situation is becoming exceedingly complicated, and it is almost impossible to give exact quotations. From some points of view the market looks stronger, but developments are being made that are confusing to the most experienced men in the trade. There is certainly no pessimism to be found anywhere, but the altitude to which prices have climbed suggests extreme conservatism until the atmosphere becomes clearer than it is to-day. Undoubtedly there is a considerable demand yet, and prices so far have been maintained at the extreme limit of the past few weeks, and in some cases advances have been obtained. Still, there is no rushing in to get Pig Iron without regard to prices, except in one or two instances in which consumers have been caught badly short, and in which instances prices have been paid for first half shipments which are so exceptional that it might be misleading to quote them. Moreover, it is found that there is a considerable amount of speculation by outsiders, and some recent large sales have been made for account of those who probably bought Iron at materially lower prices than are now current. This adds to the confusion, as sales are duplicated and in some cases reduplicated, so that the exact tonnage that is going into consumers' hands is not easily determined. What effect this will have a little later on it is impossible to say, although producers of Pig Iron express the opinion that Iron will be scarce anyway for months to come, so that they are not particularly anxious to extend their engagements even at the prices now ruling. There is a gratifying amount of business coming into the finishing mills, and they are doing very well and at better prices than were quoted before the holidays, plates now being 2.13½c. for ordinary ¼-in. size. The Sheet trade is also very active, and the same may be said of Structural Material, although the capacity is so large that the demand is met without much difficulty. It would probably be a little premature to take any decided stand in regard to the course of the market in the near future, and while the feeling is one of unabated confidence, there is a disposition to go a little slow until more light can be had in regard to the future.

**Pig Iron.**—As we have already said, it is extremely difficult to give anything like close quotations for deliveries in the first half of the year. There is so little stuff available that those who are fortunate enough to have it can make pretty much their own prices, which vary according to the closeness of the relation between buyer and seller, the quantity required and when it is to be delivered. Two sales made late last week perhaps fairly represent the situation,



one lot being at \$25.50 at furnace and the other at \$26, so that for January and February these are probably inside prices. For delivery in the second quarter it might perhaps be possible to do 50c. better, but, as we said before, all depends upon the circumstances in each particular case. For the third quarter \$23.50 to \$24, furnace, is the ruling figure, or \$23 to \$23.50 covering the entire last half. There does not seem to be any special urgency either to buy or sell, both sides waiting to see what will turn up the next 30 or 60 days. Foreign Iron is quite firm at \$23 on dock for No. 3 Middlesbrough and \$25 for Scotch, at which figures a large business has been done the past two or three weeks. The vessels carrying foreign Iron are not making good time, owing to the stormy weather, so that consumers who are depending upon the arrival of this class of Iron are running pretty close to the end of their supplies. Moreover, it is said to be very difficult to get new freight room for later shipments. Of course a number of vessels that were chartered some time ago will be loaded during this month, but for later dates freight room is scarce, so that there is not much chance of any weakening in the prices of this class of Iron, although foreign markets dropped 50c. to 75c. during the holidays. Basic Iron is scarce, and as much as \$26 and upward has been paid for large tonnages for deliveries the first half of the year. On the other hand, Lehigh furnaces have sold considerable Basic at \$24, furnace, which would cost the buyer about \$25.25 delivered. This, however, is mostly for the second quarter; but the situation is not entirely settled, so that changes of 50c. to \$1 a ton should be no surprise, and might be toward an advance or the reverse, according to the developments which may be made in the near future, but in which direction it will be by no means clear at the present time. There is a somewhat unusual demand for No. 1 X Foundry Iron, for which buyers are willing to pay \$25 at furnace for the third quarter, and some furnaces are said to be considering whether it would not be better to pay more attention to this class of Iron, as at the figure named it would be better than to make Basic. The Low Phosphorus situation is somewhat unsettled, and for the time being spot lots are not in as urgent demand as they were some time ago. An offer of \$26 at Lehigh furnace has, however, been made for 6000 tons, delivery February to August, but the price bid is not thought to be attractive enough to induce a sale, although some business may come out of it at a later date. The quotations given below are for deliveries in the last half of the year in consumers' yards, eastern Pennsylvania or adjoining territory. Deliveries in the first quarter, as we have already said, are at a premium of \$1 to \$1.50 per ton, and in some cases more than that.

No. 1 X Foundry.....	\$26.00 to \$26.50
No. 2 X Foundry.....	23.50 to 24.25
No. 2 Plain.....	23.00 to 23.50
Standard Gray Forge.....	22.50 to 23.00
Basic.....	23.50 to 24.00
Low Phosphorus.....	27.50 to 28.00
Malleable.....	25.50 to 26.50
Middlesbrough No. 3, on dock.....	22.75 to 23.00
Scotch, on dock.....	24.75 to 25.00

**Ferroalloys.**—The local demand is quite light, and quotations are therefore more or less nominal, but it is understood that some large orders have been placed for Western account. Prices for Ferromanganese range from \$80 to \$81 spot, \$78 to \$80 January shipment, and \$74 to \$75 for the last half.

**Steel.**—The demand for Steel is not urgent at the moment, although some business has been done at about \$33 to \$34 for Ordinary Rolling Billets, and \$36 to \$40 for Forging Billets. Mills have a great deal of business on hand, however, and specifications are coming in very promptly, so that everything is running as full as at any time in the past several months.

**Plates.**—The interesting feature in the Plate trade is another advance of \$2 per ton, following the continued rise in the cost of raw material and labor. The price is now 2.13½c. for carload lots of ordinary ½-in. Plates, with the usual extras. It is not to be expected that a large business will be done at the advanced prices until consumers have reduced their old contracts, which were mostly at considerably lower prices. If the demand continues, as seems probable, there will be no escape from paying the new rates, which are certainly none too high considering the cost of production. Revised quotations are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	2.13½	2.18½
Flange or Boiler Steel.....	2.23½	2.28½
Marine.....	2.53½	2.58½
Locomotive Firebox Steel.....	2.63½	2.68½
The above are base prices for ½-in. and heavier. The following extras apply:		
3-16 in. thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 in.....		.05
Plates over 110 to 115 in.....		.10
Plates over 115 to 120 in.....		.15
Plates over 120 to 125 in.....		.25
Plates over 125 to 130 in.....		.50
Plates over 130 in.....		1.00

**Structural Material.**—There is nothing unusual in this department except that buyers are expecting to pay more money at an early date. In the meanwhile quotations remain as follows: Beams, Angles and Channels, 1.83½c. to 2c., according to specifications.

**Bars.**—There is a good demand for Bars, both Iron and Steel, and about 1.93½c. is quoted as a minimum for Best Refined Iron. Steel Bars are nominal at 1.83½c. to 1.88½c., but at the inside figure deliveries cannot be guaranteed within any reasonable time. The Iron mills are receiving prompt specifications and are kept fully employed in trying to make satisfactory deliveries on their old contracts.

**Sheets.**—There is an excellent demand for Sheets, and there is a good deal of pressure to secure prompt deliveries. Prices, however, remain as last quoted for mill shipments, and a tenth additional for smaller quantities, namely: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

**Old Material.**—The tone of the market is decidedly easier, and while asking prices are not much lower, it is extremely difficult to get business unless at decidedly lower prices. No. 1 Steel Scrap has been taken at \$19, but for new business \$18.50 does not attract much attention, and as the offerings are large buyers appear to be utterly unresponsive. The open weather seems to have upset the calculations of holders; hence their willingness to accept lower prices. Bids and offers for material delivered in buyers' yards are about as follows:

Steel Crops.....	\$18.75 to \$19.00
No. 1 Steel Scrap.....	18.50 to 18.75
Low Phosphorus.....	22.50 to 23.00
Old Steel Axles.....	22.00 to 23.00
Old Iron Axles.....	30.00 to 31.00
Old Iron Rails.....	27.50 to 28.00
Old Car Wheels.....	23.00 to 23.50
Choice No. 1 R. R. Wrought.....	23.00 to 23.50
No. 1 Yard Scrap.....	20.50 to 21.00
Long and Short.....	19.00 to 19.50
Machinery Scrap.....	21.50 to 22.00
Wrought Iron Pipe.....	16.00 to 16.50
No. 1 Forge Fire Scrap.....	17.00 to 17.50
No. 2 Light.....	12.00 to 12.50
Wrought Turnings.....	16.00 to 16.50
Axle Turnings.....	17.00 to 17.50
Stove Plate.....	16.50 to 17.00
Cast Borings.....	13.50 to 14.00
Grate Bars.....	15.50 to 16.00

## Cincinnati.

FIFTH AND MAIN STS., January 9, 1907.—(By Telegraph.)

**Pig Iron.**—The market continues very strong. Every indication points to the fact that January is simply to be a repetition of the month preceding, at least so far as Iron for prompt delivery is concerned. The gravity of the situation incident to lack of transportation facilities has gradually become more intense and there appears to be no immediate prospect of a change for the better; this, too, when it is a well-known fact that production in the territory is far below normal, making the proposition doubly serious. During the latter part of December some improvement was noticed, and furnaces received a fairly acceptable supply of cars. It was then thought that this would continue into the new year, and thus bring considerable relief to the situation generally. This has not been the case, however, and conditions have again relapsed into the old routine, causing additional expense to the producer, and delay and perhaps even worse to the consumer. Inquiry for third and fourth quarters continues strong, with considerable buying. Prices of Southern brands are about the same as reported last week, first quarter being quotable from \$23 to \$23.50, second quarter from \$21 to \$22, and last half \$19.50 to \$19, Birmingham, for No. 2. Northern Iron is quotable at \$25 current delivery, and \$21 to \$22 last half at southern Ohio furnace. An order for 6000 tons of Northern was placed for last half at \$22 at southern Ohio furnace, and a sale of 3500 tons of Northern Gray Forge is reported, to go into Chicago territory for first quarter delivery at \$21 at furnace. A northern Ohio concern paid \$19, Birmingham, for about 2000 tons last half delivery. An Ohio Pipe company is inquiring for 15,000 tons for last half delivery, the bulk of which is Southern. It is understood that one of the large Cast Iron Pipe companies is in the market for an indefinite tonnage covering any delivery. Freight rates from Hanging Rock District to Cincinnati are \$1.15, and from Birmingham, \$3. The following quotations, which are f.o.b. Cincinnati, apply to conditions prevailing one week ago and at the present time:

Southern Coke, No. 1.....	\$26.50 to \$27.00
Southern Coke, No. 2.....	26.00 to 26.50
Southern Coke, No. 3.....	25.50 to 26.00
Southern Coke, No. 4.....	25.00 to 25.50
Southern Coke, No. 1 Soft.....	26.50 to 27.00
Southern Coke, No. 2 Soft.....	26.00 to 26.50
Southern Coke, Gray Forge.....	23.00 to 23.50
Southern Coke, Mottled.....	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.65
Lake Superior Coke, No. 1.....	26.65 to 27.15
Lake Superior Coke, No. 2.....	26.15 to 26.65
Lake Superior Coke, No. 3.....	25.65 to 26.15
<b>Car Wheel Irons.</b>	
Standard Southern Car Wheel.....	\$29.00 to \$29.50
Lake Superior Car Wheel.....	27.50 to 28.00



**Coke.**—The market is strong. Shipments on contracts are much delayed by car shortage. The supply at ovens is said to be ample to cover all requirements if it were possible to move it. We quote best brands of Connellsville and Virginia Foundry from \$4.25 to \$4.50, f.o.b. ovens.

**Finished Iron and Steel.**—The situation continues strong and prices are firm and apparently well established. Contracts are said to be even better than they were a year ago. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.93c., with half extras; the same, in smaller lots, 2.10c., with full extras; Steel Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 1.95c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.83c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.93c., in carload lots.

**Old Material.**—Dealers are handling a large tonnage. Prices are unchanged and fairly well established. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 Railroad Wrought, net ton.....	\$17.75 to \$18.25
Cast Borings, net ton.....	9.50 to 9.75
Steel Turnings, net ton.....	11.75 to 12.75
No. 1 Cast Scrap, net ton.....	16.75 to 17.75
Old Iron Axles, net ton.....	26.75 to 27.75
Old Iron Rails, gross ton.....	27.00 to 27.50
Old Steel Rails, long, gross ton.....	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton.....	28.75 to 29.75
Old Car Wheels, gross ton.....	22.75 to 23.25
Low Phosphorus Scrap, gross ton.....	21.25 to 21.75

## Pittsburgh.

PARK BUILDING, January 9, 1907.—(By Telegraph.)

**Pig Iron.**—Developments of the last few days indicate strongly that a general buying movement for last half of the year delivery has started. There has been a good deal of Bessemer, Basic and Foundry tonnage sold, and at relatively high prices. We can report sales of about 15,000 tons of Basic for delivery commencing in second quarter and running over the entire year, in which was one lot of 6000 tons, on the basis of \$21.50, Valley furnace. We can also report sales of upward of 20,000 tons of Bessemer, mostly for delivery in second half, at \$22, Valley furnace. For reasonably prompt delivery Bessemer and Basic are very scarce, Basic being held at about \$22 and Bessemer \$22.50 to \$23, Valley furnace, but there is possibly no Iron to be had for delivery this side of July. In the past week the Westinghouse Air Brake Company has come into the market and has bought from 20,000 to 30,000 tons of Northern and Southern Foundry, all for delivery in last half, at prices ranging from \$21.50 to \$22, Valley furnace, for the Northern Iron, or \$22.35 to \$22.85, delivered at Wilmerding, Pa. On the Southern Iron somewhat higher delivered prices were paid. Another large consumer is in the market for about 25,000 tons of Northern and Southern Foundry Iron, part of the tonnage having been closed on the basis of \$21.75 to \$22, Valley furnace. It is said that the balance of this tonnage will be bought this week, and part of it will be Southern Iron. Much higher prices than the above are being paid for Foundry Iron for prompt delivery, and also for shipment through first and second quarters. We note small sales of Northern No. 2 Foundry for prompt delivery on the basis of \$25, Valley furnace, while \$24 is being quoted for first quarter delivery. There is also some inquiry in the market for Forge Iron, and we note a sale of 1000 tons of Northern Forge for second quarter delivery at \$21.50, Valley furnace, or \$22.35, Pittsburgh. For delivery in first quarter Northern Forge is held at about \$22, Valley furnace.

**Steel.**—Very little new tonnage is being placed in Billets and Sheet or Tin Bars, consumers being covered by contracts. Steel continues very scarce, and the mills are not catching up on deliveries to any great extent. We continue to quote 4 x 4 in. Bessemer Billets at \$29.50 to \$30, and Open Hearth Billets \$32.50 to \$33, Pittsburgh. We quote Sheet and Tin Bars in random lengths at \$29.50 to \$30, Pittsburgh, an advance of 50c. a ton being charged for Cut Bars.

(By Mail.)

**Ferromanganese.**—We quote 80 per cent. foreign Ferro for delivery over the next three or four months at about \$80, Baltimore, or \$82, Pittsburgh. There is only a fair inquiry.

**Wire Rods.**—There is still much difficulty in getting Rods for prompt delivery. We quote Bessemer Rods at \$37 and Open Hearth at \$38, Pittsburgh, but for prompt delivery it is likely they would bring higher prices.

**Muck Bar.**—Very little has been sold in this market for some months, as most consumers make their own. We quote best grades, made from all Pig Iron, at \$36 to \$37, while Bar made from part Scrap is quoted at \$33 to \$34.

**Skelp.**—Mills have their output sold up for the next three or four months, and are back on deliveries. Prices are firm as follows: Grooved Steel Skelp, 1.65c. to 1.70c.; Sheared Steel Skelp, 1.70c. to 1.75c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh, these prices depending on widths and gauges.

**Steel Rails.**—New business placed in Steel Rails in the past week was light, the Carnegie Company taking only about 10,000 tons. The demand for Light Rails is not as urgent as it was, but this is probably due to the fact that the Carnegie Steel Company is sold up for the next four or five months, and cannot take small orders, on which buyers usually want quick deliveries. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

**Structural Material.**—Inquiries in the Structural trade have been much better in the past week and some large contracts have been placed. The McClintic-Marshall Construction Company has taken about 8000 tons from the New York Central, about 1500 tons of bridge work for the Louisville & Nashville and a Steel building for the Standard Steel Car Wheel Company at New Castle, Pa., about 250 tons. This company has just bought 27 acres of land at Carnegie, Pa., where it already has Structural shops, on which it proposes to build a very large Structural plant. The American Bridge Company has taken in the past two weeks a heavy tonnage for San Francisco, and some other large work for that city is up. The market is firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Plates.**—The leading Plate concerns, such as the Carnegie Steel Company and others, are practically sold up on Plates for the first half of 1907, and the Carnegie Company has a good deal of tonnage booked for later delivery. Some of the Eastern mills quote Plates as high as 2c., Pittsburgh, for prompt shipment. We quote: Tank Plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boller and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ¼ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

**Sheets.**—There is no official change in prices, but on the heavier gauges some mills ask premiums of \$1 a ton for prompt delivery. The leading mills are filled up for the next three or four months and are four to six weeks behind in shipments. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.55c.; Nos. 12 and 14, 2.65c.; Nos. 15 and 16, 2.75c.; Nos. 17 to 21, 2.90c.; Nos. 22 and 24, 3.05c.; Nos. 25 and 26, 3.25c.; No. 27, 3.45c.; No. 28, 3.65c.; No. 29, 3.90c., and No. 30, 4.15c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.15 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

**Tin Plate.**—In the latter part of December a good deal of business was placed for delivery in second and third quarters of this year. All the mills have an enormous tonnage on their books, the leading interest being practically filled for the next six months. Prices are very firm, but without change. We quote \$3.90 per base box, f.o.b. Pittsburgh, for

14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

**Hoops and Bands.**—Consumers being covered for a long period ahead by contracts on which they are specifying freely, little new tonnage is now being placed. We quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

**Iron and Steel Bars.**—The volume of business in both Iron and Steel Bars continues fairly heavy, while specifications on contracts are being received by the mills in heavy volume. All the mills are from six to eight weeks behind in deliveries, and some for a longer period. Local mills quote 1.80c. to 1.85c. on Iron Bars, f.o.b. Pittsburgh, but some of the Eastern mills are offering Bars for delivery in this district at lower prices. We quote Steel Bars at 1.60c. to 1.65c., base, half extras, f.o.b. Pittsburgh, but premiums of \$1 and \$2 a ton over these prices are being paid for reasonably prompt shipment.

**Railroad Spikes.**—Makers of Spikes have enough orders on their books to take their output for the next two or three months, and new demand continues heavy. Prices are firm, and we quote Railroad Spikes at \$2.40 to \$2.50 per 100 lb. on contracts for future delivery, while \$2.65 to \$2.75 is quoted on orders for reasonably prompt delivery.

**Merchant Steel.**—Although the new tonnage being placed is light, consumption continues enormously heavy, and specifications on contracts are being received by the mills in such large volume that they are unable to catch up on deliveries to any extent. Prices are firm and unchanged, and we quote: Smooth Finished Merchant Steel, 1.85c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Cutter Shoe, 2.15c. to 2.20c.; Railroad Spring Steel, 1.75c. to 1.80c.; Toe Calk Steel, 2.10c. to 2.15c.; Crucible Tool Steel, 6c. to 8c. and upward, depending on quality. The demand for Shafting is fairly active, the mills being somewhat behind in deliveries. We quote Cold Rolled Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

**Spelter.**—This material is very hard to obtain for spot delivery, and is bringing high prices. We quote prime grades of Western at 6.50c., St. Louis, equal to 6.62½c., Pittsburgh.

**Pipes and Tubes.**—A contract for 60 miles of 16-in. Pipe for a gas line has just been placed, this being one of the largest orders for this size given out for some time. The general demand continues heavy, and the leading Pipe mills have their output sold up for the next two or three months or longer. Prices are firm, the extreme discount on Merchant sizes of Steel Pipe now being about 77 and 5 off and on Iron Pipe about 72 and 5 per cent. off, for ¾ to 6 in., to the large trade. Official discounts on Steel Pipe, which are shaded about one point or more to the large trade, are as follows:

Merchant Pipe.	Jobbers, carloads.	
	Black.	Galv.
¾ to 1 in.	.68	.62
1 in.	.70	.66
1½ in.	.72	.60
2 to 6 in.	.76	.66
6 to 12 in.	.71	.56
Extra strong, plain ends:		
¾ to 1 in.	.61	.49
1 to 4 in.	.68	.56
4½ to 8 in.	.64	.52
Double extra strong, plain ends:		
¾ to 8 in.	.57	.46

**Boiler Tubes.**—New demand has fallen off to some extent, most large consumers having covered their requirements for some time prior to the recent advance in prices. It is said that official discounts are being held as follows:

Boiler Tubes.	Iron.	
	Steel.	
1 to 1½ in.	.42	.48
1½ to 2½ in.	.43	.60
2½ in.	.48	.62
2½ to 5 in.	.55	.68
6 to 13 in.	.43	.60

**Iron and Steel Scrap.**—There has been a lull in the Scrap trade for the past two or three weeks, and with some of the dealers anxious to make sales prices have gone off on nearly all kinds of Scrap from 50c. to \$1 a ton. Opinion is divided as to whether the decline will extend any further, but it is believed that the demand will soon show betterment, as consumers who refused to take in Scrap during inventory period have finished this and are expected to come in the market as buyers again before long. Embargos on Scrap at Toledo, Ohio, and Sharon, Pa., have also adversely affected the situation. We have reduced our prices from 50c. to \$1 a ton, and now quote as follows: Heavy Steel Melting Scrap, \$19 to \$19.25 for Pittsburgh or Sharon delivery; No. 1 Wrought Scrap, \$20.50; No. 2 Wrought Scrap, \$18.50; Wrought Turnings, \$15.50; Bundled Sheet Scrap, \$17 to \$17.25; New Tin and Terne Plate Clippings, \$19 per net ton; Old Steel Rails, Short Pieces, 6

ft. and under, for Open Hearth purposes, \$19 to \$19.25; Old Steel Rails, rerollers, \$21; Low Phosphorus Melting Scrap, \$24; Cast Iron Borings, \$12.50. Prices on Old Car Wheels, Steel Axles and No. 1 Cast Scrap are particularly weak. We quote Old Car Wheels from \$21 to \$21.50; Steel Axles, \$23 and No. 1 Cast Scrap, \$21. Stove Plate is in good demand, and is held at \$16.50, while Grate Bars are quoted at \$15.50. All above prices are per gross ton, f.o.b. Pittsburgh, unless otherwise specified.

**Coke.**—There seems to be a scarcity of Connellsville Furnace Coke for prompt shipment, and it continues to bring from \$3.50 to \$3.60 a ton, at oven. Connellsville 72-hr. Foundry Coke is held at \$4.25 to \$4.50 a ton, at oven, for prompt delivery. On contracts for first half of the year delivery best grades of Connellsville Furnace Coke are held at \$3 to \$3.25, and 72-hr. Foundry at \$4 to \$4.25 per ton, at oven. The output of Coke continues heavy, the Upper and Lower Connellsville regions having made last week 409,866 tons.

For the better convenience of out of town customers and in order that they might be more centrally located, Wickes Brothers have moved their offices from 1115-1117 Empire Building to 117-119 Fourth avenue, Pittsburgh, where the firm has secured both larger quarters for offices and a salesroom for its line of machinery, which is in charge of F. A. Fitzgerald, manager. A complete line of steam and gas engines, as well as iron and woodworking machinery, is being shown in the new salesroom, and which is entirely independent of the warehouse maintained on Forty-fifth street, Pittsburgh. During December Wickes Brothers closed the largest business for any one month in the last three years. Among contracts secured for Wickes water tube boilers were the following: Colonial Ice Company, Pittsburgh, 400 hp.; Vulcan Crucible Steel Company, Aliquippa, Pa., 300 hp.; Keokee Coal & Coke Company, Keokee, Va., 1200 hp.; Alliance Water Company, Alliance, Ohio, 600 hp. Orders for Corliss engines have also been received from the Penn Shovel Mfg. Company, Warren, Ohio, 1200 hp.; Vulcan Crucible Steel Company, Aliquippa, Pa., 800 hp.; American Box Company, Sharpsburg, Pa., 200 hp.; David Kirk, Findlay, Ohio, 100 hp.

## Cleveland.

CLEVELAND, OHIO, January 8, 1907.

**Iron Ore.**—The market is quiet. Although next season's expected output of standard Ores has been pretty well sold, many consumers are said not to have bought all they will need and dealers expect an active market later in the month. Not much Ore is being moved from the docks as yet. Prices remain firm but stationary. Quotations at Lake Erie docks are: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.25; Mesaba non-Bessemer, \$4. The shipyards of the Great Lakes have 45 bulk freighters under construction for 1907 delivery. Practically all of these boats will be used in the Ore carrying trade the coming season. These 45 freighters have a carrying capacity of 302,000 gross tons on a single trip, or 6,040,000 tons in an average season of twenty trips. In addition there will be added to the lake tonnage three vessels that were taken for 1907 delivery but which were delivered in the fall of 1906. These three vessels increase the available tonnage for the season by 400,000 tons, making the total increase available for next season's Ore trade 6,500,000 tons. This enormous shipbuilding programme exceeds in number but not in carrying capacity the orders that the shipbuilders of the Great Lakes had a year ago. In January, 1906, shipbuilders had under order 34 bulk freighters having a carrying capacity of approximately 6,760,000 tons in a season.

**Pig Iron.**—There has been heavy buying for the last half of 1907 delivery, and prices, if anything, are a little firmer. Many foundrymen who have been holding off from making any purchases for so far ahead now seem to be convinced that there is not much chance that prices will be lower and are rushing to cover. For that reason, it seems, inquiries for the last half have been more numerous the past week than previously. Northern Foundry No. 2 is selling at \$22 to \$23 for the last half, the same as a week ago. Some dealers are asking \$23.50, but as far as can be learned none has been sold at this figure. For the first and second quarters there is practically no local Iron for sale, so that it is difficult to give quotations. Dealers who have a little for sale are making their own prices and are asking from \$26 to \$28 for spot shipment. British Iron, which entered the local market about 10 days ago to supply the urgent immediate demand, is still being sold freely in this city and vicinity. No large sales are reported, but many foundrymen are making small purchases to fill out, being unable to secure spot Iron elsewhere. The foreign Iron is sold at \$25.50, Cleveland, and deliveries can be had promptly. Some Basic Iron has been sold at \$24 for spot shipment and \$22 for last half at the furnace. There is some call for Southern Iron for the last half. None is being sold for the first half.



Quotations for the last half, 1907, f.o.b. Cleveland, are as follows:

Northern Foundry, No. 1.....	\$22.50 to \$23.50
Northern Foundry, No. 2.....	22.00 to 23.00
Northern Foundry, No. 3.....	21.50 to 22.50
No. 2 Southern, f.o.b. Birmingham.....	19.00
Gray Forge.....	21.00 to 22.00

**Coke.**—The market remains firm and quiet, with no change in prices. Most foundries have contracted for the first half, and there is very little if any being sold now for the last half. Foundry Coke is selling at \$4.25 at the ovens for prompt shipment and for the first half. Furnace Coke is quoted at \$3.50 to \$3.75 at the ovens.

**Finished Material.**—The market is active and strong in all kinds of Finished Material. Premiums continue to be paid for some materials for prompt shipment. The demand for Plates is unusually heavy and mills are getting further behind with their deliveries. Some smaller mills that had been able to make prompt shipment are unable to do so now. The heavy demand at the present time is attributed to large specifications for Car and Ship Plates. Plates are selling at 1.75c. to 1.85c., Pittsburgh, for prompt shipment, and some Eastern mills are asking 2c., Pittsburgh. For future delivery they are bringing 1.70c., Pittsburgh. The demand for Steel Bars is also unusually heavy and mills are getting further behind with deliveries. Dealers are asking from 1.70c. to 1.90c., Pittsburgh, for early shipment, and good premiums are being paid for prompt delivery. Local warehouses are getting 1.95c. for Steel Bars out of stock, the same as a week ago. The demand for Iron Bars is not so heavy. They are being sold on the basis of 1.80c., Pittsburgh, and purchasers can get fairly prompt deliveries. Local jobbers are asking 2c. for Iron Bars out of stock. Sheet deliveries continue very slow. Some sales were made during the week by Eastern mills at a large premium for quick delivery. Sheets are being sold out of stock at the following prices: Blue Annealed, No. 10, 2.25c.; No. 28 One Pass Cold Rolled, 2.90c.; No. 28 Galvanized, 3.90c. One local jobber has received a mill's notification that its price quotations on Iron Pipe were withdrawn. Forging Billets are scarce, but fairly good deliveries can be secured in the smaller sizes. Prices range from \$36 to \$40, Pittsburgh, for prompt shipment. Structural Material is in good demand, and orders can be filled in 30 days by splitting them up among different mills. The price quoted is 1.70c., Pittsburgh. A limited amount of Structural Material is being sold by Eastern mills at a premium.

**Old Material.**—The market continues weak. Dealers are looking for greater activity later in the month. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$18.00 to \$18.50
Old Iron Rails.....	26.50 to 27.00
Steel Car Axles.....	21.50 to 22.00
Old Car Wheels.....	21.50 to 22.00
Heavy Melting Steel.....	18.00 to 18.50
Railroad Malleable.....	19.00
Agricultural Malleable.....	16.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$29.75 to \$30.25
Cast Borings.....	10.50 to 11.00
No. 1 Bushing.....	16.00
No. 1 Railroad Wrought.....	18.50 to 19.00
No. 1 Cast.....	18.50 to 19.00
Iron and Steel Turnings and Drillings.....	13.00 to 13.50
Stove Plate.....	16.00

## New York.

NEW YORK, January 9, 1907.

**Pig Iron.**—A demand for spot lots continues to crop up, and at the present time is most conspicuous in Basic Iron. There have been some further sales of Basic Pig Iron both for earlier and for later delivery. A New Jersey furnace has sold its entire output of Basic Pig for the next three months on the basis of \$24, at furnace. In Foundry Iron there is no large tonnage under negotiation, but there is steady buying well into the second half. We quote spot Northern Iron, in small lots, the only available, \$26.50 to \$27 for No. 1 X, tidewater, and \$25.50 to \$26 for No. 2 X. For the first half we quote \$26 to \$26.50 for No. 1 Foundry, \$24.50 to \$25 for No. 2 Foundry and \$24 to \$24.50 for No. 2 Plain, tidewater delivery. For the second half we quote \$23.50 to \$24 for No. 2 Foundry. No. 2 Middlesbrough is \$22.50 to \$23, on dock, and Scotch \$24.50 to \$25, on dock.

**Steel Rails.**—The business for the first week of the year has been light, the principal order coming from the South Dakota Central, amounting to 6000 tons. The Minneapolis & Rainy River bought 1300 tons, and there were miscellaneous orders amounting to 1500 tons. The large orders are now in, and the capacity of certain Pennsylvania mills that have recently asked \$30 for Bessemer Rails is so well taken that the advance does not signify as much as has been credited in some published references.

**Structural Material.**—The mills have come upon a quieter time so far as specifications are concerned, though

in some quarters December business booked was in excess of any record in several months preceding. Money market conditions are referred to in explanation of the recent slackness at the mills, and there is also evidence that the increased capacity provided last year has cured delivery troubles on the commoner sizes. The contract of the Denver & Rio Grande for 900 tons of bridge work went to the Pennsylvania Steel Company. The Northwestern Railroad contracted for 350 tons for station work in the past week, the business going to Wood & Allen. It is understood that the 8300 tons of Steel for the Blackwell Island bridge approach has been virtually placed, though official announcement has not been made. The 48-story tower projected for the Metropolitan Life Insurance Company's building at Twenty-third street and Madison avenue, New York, is on a scale that is expected to require about 8000 tons of Steel. Other local business pending includes 2000 tons for the World Building extension and 2000 tons for a loft building at Fourteenth street and Fifth avenue. We continue quotations on mill shipments, tidewater delivery, as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales out of stock of material cut to length are at 2¼c. to 2½c.

**Bars.**—Quite a satisfactory volume of business in Bar Iron is now being enjoyed, and prices are well maintained at 1.89½c. to 1.94½c., tidewater. Steel Bars are naturally taking a good share of the current Bar business, as prices range from 1.74½c. to 1.84½c., tidewater. Deliveries on most sizes of Steel Bars can be made at the lower rate within 60 days, but on large sizes the Steel mills are closely sold up for several months.

**Plates.**—Considerable inquiry is noted, but local buyers have recently hesitated to close orders with the Eastern mills owing to the decided spread between their quotations and those of the Western mills. It is not believed, however, that the Western mills have taken much business from this locality recently, as they are unable to make deliveries in less than four months. Those who have hesitated to cover their immediate wants, however, are now obliged to raise their bids, as Eastern mills have made another advance of \$2 per ton and now quote a minimum of 2.14½c., tidewater, for Tank Steel. The range of quotations, taking the low price on long deliveries of Western mills and the new rate made by Eastern mills, is as follows: Sheared Tank Plates, 1.84½c. to 2.14½c.; Flange Plates, 1.94½c. to 2.24½c.; Marine Plates, 2.24½c. to 2.44½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

**Cast Iron Pipe.**—The inquiry for Pipe keeps up well, although it must be to some extent influenced by the fact that at this season many buyers have been balancing their books for 1906 and have not as yet completed all their arrangements for the coming year. Prices are firm and sales are noted as high as \$34 to \$34.75, f.o.b. foundry, for 4-in. Water Pipe. Quotations for general business run at about \$35 to \$35.75 per net ton on 6-in. at tidewater.

**Old Material.**—The most important occurrence of the week has been the sale of 20,000 to 25,000 tons of Steel Scrap at better than \$19, delivered, eastern Pennsylvania, for spring delivery. This is somewhat surprising, in view of the fact that embargoes on deliveries at large mills in that section had been assumed to cause some recession in prices. Evidently consumers are not of this opinion or they would not be willing to make contracts of the kind above noted. If it should happen that the large blocks of Steel Scrap thus sold must be hereafter secured by the sellers, the market toward spring may show some interesting developments. Foundry material is in continued strong demand, but purchases of Rolling Mill Material run to the cheaper grades of such stock, Wrought Scrap being somewhat neglected. The L. K. Hirsch Company has made a large exchange trade, giving Scrap for Billets and Slabs. Approximate quotations per gross ton, New York and vicinity, are as follows:

Old Iron Rails.....	\$24.50 to \$25.00
Relaying Rails.....	28.00 to 29.00
Old Steel Rails, rerolling lengths.....	18.50 to 19.00
Old Girder and T-Rails for melting.....	16.25 to 16.75
Heavy Melting Steel Scrap.....	16.25 to 16.75
Standard Hammered Iron Car Axles.....	28.50 to 29.50
Old Steel Car Axles.....	21.00 to 22.00
No. 1 Railroad Wrought.....	18.50 to 19.50
Iron Track Scrap.....	18.50 to 19.50
No. 1 Yard Wrought, long.....	18.50 to 19.00
No. 1 Yard Wrought, short.....	18.00 to 18.50
Wrought Pipe.....	14.50 to 15.00
Light Iron.....	11.00 to 11.50
Cast Borings.....	10.50 to 11.00
Wrought Turnings.....	14.50 to 15.00
Old Car Wheels.....	21.75 to 22.25
No. 1 Heavy Cast, broken up.....	18.50 to 19.50
Stove Plate.....	15.00 to 16.00
Grate Bars.....	14.00 to 14.50
Malleable Cast.....	18.00 to 19.00

Sterline is the name of an alloy resembling silver in appearance. Its composition is 68.52 per cent. copper, 12.84 per cent. zinc, 17.88 per cent. steel and 0.76 per cent. iron.

## Metal Market.

NEW YORK, January 9, 1907.

**Pig Tin.**—The drop of between 60 and 70 points on the 3d brought out an astonishingly good inquiry, and a fair amount of Tin was sold at 41.17½c. The greater part of the business of that day, however, was done at 41.12½c., and it is estimated that the total sales aggregated in the neighborhood of 250 tons. On the 4th prices declined still further, and the lowest quotation of the week, 41c., was made on that day. On the 7th the market stiffened perceptibly and a little business was done at 41.50c. On the 8th a few small lots were sold at 41.37½c. To-day Tin can be had at 41.55c. Those interested in depressing the market have been aided by the tightness of money both here and in London, which has shaken out some of the weaker accounts. It is said, too, that the present decline is aided by the selling of a large consuming interest in this country. It seems, however, that a battle of more than ordinary magnitude is now prevailing on the London Exchange. It is rather disappointing to those who are looking for higher prices that no large amount of business was transacted during this decline. In the London market to-day spot is quoted at £190 10s. and futures at £190 5s. Arrivals so far this month aggregate 1640 tons and the afloats 1435 tons.

**Copper.**—Twenty-five cents per lb. was paid for a carload of Lake Copper for prompt shipment last week. This is, of course, a premium over the price which would be asked for future delivery, but it serves well to illustrate the fact that a famine is now prevailing and consumers are compelled to pay well for prompt shipments. Another feature of the week has been the orders taken by a leading selling interest for May delivery of Electrolytic at 24c., while small amounts have also been contracted for June delivery at this same price. The general range of quotations for future delivery would be 24¼c. to 25c. for Lake, 24c. to 24½c. for Electrolytic and 23.87½c. to 24.37½c. for Casting grades. The exports so far this month are small, aggregating 4686 tons. European prices are again higher than a week ago, £105 12s. 6d. being quoted for spot, £106 12s. 6d. for futures and £113 10s. for Best Selected.

**Pig Lead.**—This market is exceptionally strong, and it is rumored, and not without good foundation, that the American Smelting & Refining Company is at least 60 days behind on its orders, or, in other words, is unable to make shipments on contracts now being placed before the latter part of March. Its terms continue unchanged, as also the price of 6c., which covers old contracts. Spot Lead in New York is extremely scarce, 6.30c. being readily paid for any carloads obtainable. In St. Louis the market is also very firm at 6.10c. to 6.12½c. The American consumers of Lead, particularly those on the Atlantic seaboard, will undoubtedly continue to be interested in the foreign Lead market, as the importations are likely to become a feature of the trade this year. At present London prices are practically unchanged at £19 16s. 3d.

**Spelter.**—Practically all the available Spelter has been picked up, and it is hard to find anything for nearby delivery, either here or in the West. There are said to be a few odd carloads available at between 6.80c. and 6.90c., while futures can be had at 6.70c. The St. Louis market is quoted at 6.70c. for spot. The London market is unchanged at £27 15s.

**Antimony.**—The market is practically unchanged at 26c. for Cookson's, 25c. for Hallett's, and 24½c. to 25c. for other brands.

**Ferroalloys.**—Ferromanganese is again easier and prime lots can be had at about \$75 per ton at seaboard. Ferro-silicon is very strong and in excellent demand, having taken another upward turn in the last few days. European manufacturers are drawing the attention of the trade to the fact that raw materials which enter into the composition of Ferrosilicon have advanced rapidly, pointing out such increases in price as 30 per cent. for Coke, 40 to 50 per cent. for Iron and 100 per cent. for Copper, and also the fact that building materials have gone up considerably, a fact which reacts greatly upon the selling price of this material in consequence of the rapid deterioration to which certain parts of their plants are subjected. Sales have been made as high as \$112, but the market can be quoted at \$110 upward. Old contracts are running at slightly lower figures.

**Tin Plate.**—The price is unchanged at \$4.09 per base box, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh. In Swansea Tin Plates are 3d. lower, at 14s. 9d.

**Old Metals.**—Following a higher range of quotations for Ingot Copper dealers in Old Metals have advanced their selling prices. Composition is in particularly heavy demand, especially Heavy Machine. Dealers' selling prices are quoted as follows:

	Cents.
Copper, Heavy Cnt and Crucible.....	22.50 to 23.00
Copper, Heavy and Wire.....	22.25 to 22.75
Copper, Light and Bottoms.....	19.75 to 20.25
Brass, Heavy.....	16.00 to 16.50
Brass, Light.....	13.00 to 13.50

Heavy Machine Composition.....	20.00 to 20.50
Clean Brass Turnings.....	14.50 to 15.00
Composition Turnings.....	17.50 to 18.00
Lead, Heavy.....	6.00
Tea Lead.....	5.75
Zinc Scrap.....	5.00

## Iron and Industrial Stocks.

NEW YORK, January 9, 1907.

Some degree of buoyancy characterized the stock market during the past week, in which the Iron and Steel stocks participated. Quite good advances were recorded up to Monday, when in most cases the highest prices of the period under review were reached. The range of prices on active stocks for this time was as follows: United States Steel common 47½ to 50½, preferred 104½ to 107½; Car & Foundry common 42½ to 44½, preferred 101½ to 102½; Locomotive common 72¼ to 74½; Steel Foundries preferred 46 to 47½; Colorado Fuel 52¼ to 57½; Pressed Steel common 52½ to 55½; Railway Spring common 52½ to 56½; Republic common 39 to 41½, preferred 97 to 100; Sloss-Sheffield common 74 to 77½; Tennessee Coal 160 to 162; Cast Iron Pipe common 46½ to 49½, preferred 84½ to 88½; Cambria 39½ to 44½. The most noteworthy features of the foregoing prices are in connection with Steel common and Cambria. Steel common reached the highest point since 1902, and Cambria also reached the highest point it has attained for a long time, causing reports to be circulated of some interest buying for control. Last prices on active stocks up to 1.30 p.m. to-day are reported as follows: United States Steel common 49½, preferred 106½; Car & Foundry common 44½, preferred 102½; Locomotive common 73¼, preferred 109; Steel Foundries common 10½, preferred 47; Colorado Fuel 56½; Pressed Steel common 55, preferred 99½; Railway Spring common 54½; Republic common 40, preferred 99½; Sloss-Sheffield common 74; Tennessee Coal 161½; United States Cast Iron Pipe common 48½, preferred 87½; Can common 6, preferred 54.

The Pittsburgh Coal Company, Pittsburgh, has issued a comparative statement of its earnings for November and for the 11 months ending with that month, as follows:

	Month of November, 1906.	1905.
Gross earnings.....	\$564,855.43	\$355,120.52
Less allowance for depletion of coal lands.....	62,279.92	56,852.04
Less allowance for depreciation of plant and equipment.....	103,093.00	108,663.00
Less accrued interest on first mort- gage bonds.....	95,945.17	99,420.84
Net earnings.....	\$303,537.34	\$90,184.64
	Eleven months 1906.	1905.
Gross earnings.....	\$4,781,708.68	\$3,014,151.09
Less allowance for depletion of coal lands.....	685,190.86	536,991.29
Less allowance for depreciation of plant and equipment.....	1,081,243.84	530,324.21
Less accrued interest on first mort- gage bonds.....	1,071,277.49	1,107,666.10
Net earnings.....	\$1,943,996.49	\$839,169.49

Interests identified with the Hall Signal Company are planning the formation of a new company, with a capital stock of \$10,000,000, to take over the present company and to supply additional working capital. The present company has a capital of \$100,000 preferred and \$1,900,000 common stock, for which it is proposed to issue a corresponding amount of preferred stock in the new company, which is to have \$5,000,000 preferred and \$5,000,000 common stock. The present preferred stockholders are to be given \$20 a share in addition to their new stock. There is to be issued \$1,000,000 of preferred stock at par, with a bonus of \$1,000,000 common, the present shareholders to have the right to subscribe to the stock prior to January 20. This issue has been underwritten by J. S. Bache & Co., who for their services are to be given \$2,500,000 of new common stock. The new company is to retain in its treasury \$2,000,000 preferred and \$1,500,000 common stock. According to this plan, the outstanding capital stock is to be increased from \$2,000,000 to \$6,500,000 upon the payment of only \$1,000,000 more into the treasury.

The American Car & Foundry Company reports its net earnings from operation for the quarter ending October 31, 1906, at \$1,779,982.83; less dividend for the same period, \$675,000; surplus earnings for the quarter, \$1,104,982.83; former surplus as per statement October 1, 1906, \$15,245,147.87; total surplus, not including November and December earnings, \$16,350,130.70.

An official statement of the General Electric Company for the 10 months ending October 31 shows the following: Sales, \$41,774,812; cost of manufacturing and selling, \$34,303,325; net, \$7,471,487; other income, \$525,366; total income, \$7,996,853; interest on debentures, \$55,796; balance, \$7,941,057; dividends, \$3,258,218; surplus, \$4,682,839; previous surplus, \$12,027,295; total surplus, \$16,710,134.

**Dividends.**—The Standard Underground Cable Company, Pittsburgh, has declared a quarterly dividend of 3 per cent. and an extra dividend of 5 per cent., payable January 5.



The National Fireproofing Company, Pittsburgh, has declared the regular quarterly dividend of 1 per cent. and an extra dividend of 1 per cent.

The La Belle Steel Company has declared a special stock dividend of 8 per cent., payable January 20 to stockholders of record January 5, and the regular quarterly dividend of 2 per cent., payable February 1 to stockholders of record January 21, thus making the cash quarterly disbursementment applicable on the new stock as well as on the existing issue.

The Montreal Steel Works, Limited, has declared a quarterly dividend of  $1\frac{3}{4}$  per cent. on the preferred and an annual dividend of  $4\frac{1}{2}$  per cent. on the common stock, payable January 8.

The American Rolling Mill Company has declared a quarterly dividend of  $1\frac{1}{2}$  per cent. on the preferred and  $2\frac{1}{2}$  per cent. on the common stock, payable January 15.

The Nova Scotia Steel & Coal Company has declared a quarterly dividend of 2 per cent. on the preferred stock, payable January 15.

The Harbison-Walker Refractories Company, Pittsburgh, has declared the regular quarterly dividend of  $1\frac{1}{2}$  per cent., payable January 20.

### The Benson Mines Leased.

A. W. Thompson and associates have just concluded negotiations with the Magnetic Iron Ore Company for a lease of the Benson mines in St. Lawrence County, New York. The lessees have formed the Benson Mines Company, a New York corporation, with a paid in capital of \$200,000. John C. Eden is president of the company and Wayne Wills, vice-president. The directors are A. W. Thompson, John C. Eden, Wayne Wills, E. N. Ohl and Henry Cassal. The office of the company will be at Benson Mines Post Office.

The property acquired is on the line of the New York Central & Hudson River Railroad, Carthage Branch, at its junction with the Cranberry Lake Railroad. The Magnetic Iron Ore Company, of which the Benson heirs owned practically all the stock, held in fee 2826 acres, including the village of Benson Mines, with mining equipment, concentrating plant and department store. The company also had mineral rights in about 260,000 acres in St. Lawrence and adjoining counties. The Benson Mines Company has purchased all the personal property and has leases on all the ore lands. The Benson mines consist of a large body of surface magnetic iron ore. The ore is estimated to extend 180 ft. below the level of the New York Central Railroad tracks, as shown by bore holes. The ore quarry shows a face of ore which has been worked for 1500 ft. in length with an average height of over 30 ft. The average metallic iron content of the Benson ores is 33 per cent., and the drill has passed through ore running from 40 to 45 per cent. in iron. Concentrates from this ore finer than 50 mesh run 64.18 per cent. in iron, 1.58 in manganese, 0.461 in sulphur and 0.037 in phosphorus. The phosphorus content of the concentrates varies from 0.025 to 0.05.

The Benson Mines Company has ordered additional crushers for the operation of the property and will use a steam shovel in the mining of the ore after it has been broken up by explosives. Eventually a new concentration plant may be installed, but this is not contemplated in the immediate future. The idea of the new purchasers is to get the property in operation as soon as possible and to mine ore for sale in the form of concentrates in the open market. Shipments can be made advantageously both to eastern and to western Pennsylvania furnaces. It is expected that about 500 tons a day can be produced at the start. In the time of its operation by the original owners the Benson property shipped about 150,000 tons of high grade concentrates, which were sold to blast furnace and steel companies in Pennsylvania for the manufacture of Bessemer and foundry irons.

**The International Rail Syndicate.**—It is reported in the German iron trade that the International Rail Syndicate has been extended for five years from June, 1907. The German mills reserve the right to withdraw in case their Steel Syndicate is not renewed. Late reports are that the Cargo Fleet Iron Company, Middlesbrough, England, is now included in the International

Syndicate. There has been some comment on the possibilities of Russian competition. Reports from the south of Russia refer to offers of both rails and beams by Russian mills at from £5 5s. 7d. to £5 16s. 5d. per ton, f.o.b. Antwerp, prices which are not very encouraging for Belgian exporters. Russian works succeeded both in Turkey and Roumania in competition with Germany last year.

### New Railroad Construction in 1906.

The statistics of the *Railway Age* show 6067 miles of new track laid in the United States in 1906, or more than in any year since 1888, when the total was 7106 miles. The record year was 1887, with 13,000 miles of main line. The figures of the *Railroad Gazette* for 1906 show a total of 5623 miles of new track built in 1906, this total including 57 miles of new main track relocated. The total railroad mileage of the United States is now put at 223,139. Returns from Canada, but not entirely complete, show 973 miles of new track laid last year on 31 lines, the Canadian Pacific contributing 292 miles and the Canadian Northern 347 miles. Incomplete returns from Mexico report 245 miles of new track on nine lines.

The completion of its open hearth steel works operating in connection with its tin plate and black sheet mills was recently taken advantage of by the Follansbee Brothers Company to hold a convention at the home office in Pittsburgh of its branch managers and traveling representatives—some 20 in all. Several days were profitably spent in exchanging ideas and looking over the plant at Follansbee, W. Va., now in full operation. This opportunity for personal observation extends and ripens each salesman's ability to understand and meet the requirements of his personal customers. Each man undoubtedly returned to his post with increased enthusiasm and a better knowledge of the special manufacturing processes employed in which the quality of product is regulated by the character of the furnaces, modeled after the best practice of the Welsh tin plate manufacturers, additionally safeguarded by hammering the blooms under an 8-ton hammer to insure the regularity so desirable for highest quality roofing and bright charcoal tin and for stamping and drawing sheets.

The Machinists' Union at Toledo, Ohio, recently voted to demand a straight increase of 10 per cent. and the establishment of a minimum wage rate and demands were made last week on a number of shops, with answers expected from the several shops at different times. The first attacked was the Toledo Machine Tool Company, and upon its refusal the machinists struck January 7. It is felt that this action by the union is in the nature of a retaliatory measure for failing to win in the recent strike inaugurated at the Pope Motor Company's plant, as the wages in that city compare very favorably with others.

The popularity of the Chicago Pneumatic Tool Company's product is attested through the fact that practically all foreign railroads have installed these tools in their shops, as well as a great many of the larger industrial institutions and Government shipyards. The Chicago Company controls the market abroad about on the same percentage as throughout the United States, Canada and Mexico—that is, 90 per cent. of the pneumatic tools used are of the Chicago Company's make.

The blooming mill of the Troy Works of the United States Steel Corporation is being removed to the Bay View plant, at Milwaukee, where the capacity has been inadequate. The Troy plant has been idle for years.

It is stated that shipment was made recently from Port Adelaide, Australia, of 2000 tons of iron ore for consumption in Great Britain. The mine is said to belong to the Broken Hill Proprietary Company, and the ore averages about 60 per cent. metallic iron.

## The Machinery Trade.

NEW YORK, January 9, 1907.

Quite contrary to former years, which usually opened in a quiet and unassuming way, giving merchants and manufacturers a few days to take stock and prepare to capture future business, the present year began amid great activity with no let up and an increasing demand for machinery. On December 31 good sized orders and inquiries were received, and the volume of both that came in each succeeding day was large. Even with deliveries so far in the future merchants have about all they can attend to, and are exerting every effort to obtain tools to supply their customers. Although it is talked of in the trade as a foregone conclusion that the standard tools in the plant of the W. S. Burn Mfg. Company, to be sold Thursday at auction at New Haven, Conn., will fetch as high and in some cases higher prices than manufacturers' list prices for the same tools, many in this city are planning to attend the sale in the endeavor to get a few tools. Most of the inquiries before the trade are for small and medium sized lots, but specifications for a large amount of power plant equipment have been received from the engineers of the Pennsylvania Railroad terminal, in this city. There is further talk of increased prices on certain parts of machine tools, including chucks.

The large amount of business on the books of engine builders is manifested in the bids opened January 4 at the Bureau of Filtration, Philadelphia, for four pumping engines for the Lardner's Point pumping station. Bids were received from four of the important builders of the country, and the earliest delivery proposed for the first engine is nearly two years hence, the others to be delivered at intervals of about three months, extending the time to considerably over two years before the four engines can be installed.

The Babcock & Wilcox Company has bought from the Stirling Consolidated Boiler Company, as of December 31, 1906, its American property and interests, including all accounts and bills receivable, and has assumed its obligations and will execute its orders and contracts for boilers and appurtenances for installation and use in the United States. The plants thus purchased will be operated in the future by the Babcock & Wilcox Company under the name and style of the Babcock & Wilcox Company, Stirling Department, and will be operated under the direct charge and management of the same gentlemen who have operated the Stirling Consolidated Boiler Company. The gentlemen who have been connected with the Stirling Consolidated Boiler Company in its sales department will be associated with the Babcock & Wilcox Company in similar capacities. The Babcock & Wilcox Company, Stirling Department, will manufacture the Stirling, Aultman & Taylor and Cahall water tube boilers and appurtenances heretofore manufactured by the Stirling Consolidated Boiler Company.

### Association Notes.

Official announcement of the concurrent meetings of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association has been made, naming May 8, 9 and 10 as the dates selected. The meetings will be held at the new Hotel Sinton, Cincinnati, Ohio, which was selected for headquarters by a joint committee appointed by the three associations. This committee will arrange all matters pertaining to the reservation of accommodations for those stopping at the headquarters hotel, F. D. Mitchell, 309 Broadway, New York, being the chairman of the committee. By arranging all accommodations through a central committee it is thought that the problem of taking care of so large a number of delegates and guests as promise to attend the Cincinnati meetings will be solved in the most expeditious manner possible. This move is also a most pleasing indication of the very close affiliations borne toward one another by these three important organizations in the machinery and supply trade.

The annual meeting of the Niagara Frontier Purchasing Agents' Association was held December 8 and the following officers were elected: John M. Allen of the Lackawanna Steel Company, president; B. W. Robb of the Jacob Dold Packing Company, vice-president, and H. W. Newton, secretary. Mr. Newton, who is purchasing agent for the Contact Process Company, Buffalo, N. Y., succeeds L. M. Cramer, formerly purchasing agent for the Snow Steam Pump Works. Mr. Cramer is now purchasing agent for the International Steam Pump Company, with headquarters at its main offices, 114 Liberty street. The Executive Committee of the association is composed of the officers and George W. Whittemore of the Bell Telephone Company and C. C. Mosher of the Union Carbide Company, Niagara Falls, N. Y.

### Machinery Requirements for Pennsylvania Railroad Station.

The largest inquiry reported in the trade this week was the one sent out by Westinghouse, Church, Kerr & Co. for the power plant equipment for the new Pennsylvania terminal station in this city. The specifications call for a large quantity of all classes of equipment for the power plant, but it is understood that no machine tools are included in the list. This undertaking is of such magnitude that it is likely that considerable in addition to the regular power equipment will be required, and it will not be surprising to hear of some machine tool purchases being made later on.

In connection with the above it will be of interest to note that the engineers of the New York Central Railroad are getting up the list of requirements for that company's new station. This list has been under way for some time, and from present indications it will be issued shortly. The road has purchased quite a few tools within the last week.

Plans have been completed for the new shops to be built at Rutherford, Pa., by the Philadelphia & Reading Railroad. The new shops will be 123 x 602 ft., and will include machine shop, blacksmith shop and other departments necessary for general repair work.

The Illinois Iron & Bolt Company, of which J. F. Fierke is president, and which has a plant at Carpentersville, Ill., has decided to erect a new plant at Chattanooga, Tenn., where 40 acres of ground have been purchased. It is understood that work of construction is to be started within the next few weeks, and that the building to be erected will be of considerable size, necessitating the installation of quite a quantity of new machinery.

The Maxwell-Briscoe Motor Company, Tarrytown, N. Y., builder of automobiles, is to erect a large plant at New Castle, Ind., and proposes to remove its business to that place. The main building of the new plant will be 60 x 720 ft. and two stories; the forge shop 60 x 250 ft. and two stories; and the machine shop 250 x 660 ft., constituting 11 bays each 60 ft. in width. The buildings will be connected throughout, with the exception of the power house, which will be 50 x 200 ft. Figures are already being received for the foundations by Lockwood, Greene & Co., Boston, Mass., the engineers who have planned the works, and it is expected that the buildings will be completed, ready for occupancy, by May 1. Every effort will be made to accomplish this end. The Maxwell-Briscoe Company will itself place all orders for machinery and other equipment, and will be in the market immediately, it is understood. So large a plant will call for a very large amount of machine tools as well as general equipment, including boilers and engines, cranes, &c.

The Scofield Company, Philadelphia, Pa., has been awarded contract No. 17 for work on the Erie Barge Canal, at its bid of \$846,793. The company has not yet decided on the new machinery which will be used for carrying out its contract. Thus far contracts have been let for work on the canal to cost about \$20,000,000, and 70 miles out of the total of 440 are contracted for.

The Hyatt Roller Bearing Company, Harrison, N. J., will hold its fifth annual collation and vaudeville entertainment on Wednesday evening, January 16, in the Astor Gallery of the Waldorf-Astoria, Fifth avenue and Thirty-fourth street, New York. These meetings are held by the company every year as a special feature of the company's annual exhibition at the automobile show. They are always very enjoyable, and the talent is the best that can be obtained.

### Power Work.

In addition to the large amount of foreign work, which the engineering firm of J. G. White & Co., 49 Exchange place, New York, has under way, the company is pushing a number of large traction projects to completion in this country, and during the year considerable will be bought in the way of machinery equipment, especially in the power field. One of the most important projects the company is undertaking in this country is the work of reconstructing practically all the public service properties in Schuylkill County, Pa., which are now controlled by the Eastern Pennsylvania Railway Company. J. G. White & Co. have been appointed engineers and operating managers for the controlling syndicate, and the existing 60 miles of electric road is being overhauled and some additions are being made, chief among which is a new line, 8 miles long, between Middleport and Tamaqua, and a 14-mile addition will be made from Pottsville to Shenandoah. Large additions are being made to the light and power plant of the Pottsville Union Traction Company, and general enlargements are being made to all of the company's light and power plants. Another important construction is that of 54 miles of high speed electric railroad from Rochester to Lockport, N. Y. It will be a double track line, and with the electric road from Rochester east to Lyons, just completed, will form a link one-third the length of New York State. The company will also reconstruct the public utilities plants in Rock Island and Moline, Ill., and Davenport, Iowa. This work will include the centralization of power generation by the elimination of antiquated plants. All the current in the three cities will



be generated in a modern steam and hydraulic station, and one large gas plant will be built to furnish the distributing system of the three cities, and considerable track construction will be carried out.

The Nevins, Church Press Company, 135 William street, New York, is having plans prepared for a plant to be built at East Orange, N. J. The company does high grade color printing and it expects to about double the size of its present plant, which is at Bloomfield, N. J. There will be a main building, 275 x 275 ft., one story in height, and a power house, 50 x 50 ft. and one story. A power plant of about 300 hp. will be installed, and although the machinery in the present plant will be moved to the new buildings when they are completed, the company will buy some additional equipment. Fred Phelps, 15 Clinton street, Newark, N. J., is the architect and consulting engineer, and will probably have charge of the purchasing.

A number of capitalists in Pennsylvania are planning to construct large power plants at the mines to manufacture electricity from coal that it does not pay to ship to market, transmitting the power to the surrounding towns. There are said to be millions of tons of this coal, which can be used profitably in large plants where no cost of transmission is involved. The first large plant to use this fuel is being erected at Harwood, Pa., by the Harwood Transmission Company, which has lately been incorporated by Calvin Pardee of Philadelphia, Pa.; Alfred Pardee, Ario Pardee, Calvin Pardee, Jr., and A. W. Drake, general superintendent of the Lattimer and Harwood coal mines. This plant will supply power to Reading, Allentown, Sunbury, Mauch Chunk, Pottsville, Shamokin, Bloomsburg and smaller towns in the vicinity.

The Water and Light Department at Meadville, Pa., will receive bids until January 15 for one 2,500,000-gal. triple-expansion condensing direct-acting steam pump, one 3,000,000-gal. pump of same type, one 2,500,000-gal. compound condensing crank and flywheel pump and one 3,000,000-gal. pump of the same type.

#### Business Changes.

The Niles-Bement-Pond Company has appointed Harron, Rickard & McCone, 436 Market street, San Francisco, Cal., agents for its entire list of machine tools, steam hammers, hydraulic machinery and electric traveling cranes for the States of California, Nevada and Arizona.

The Latshaw Pressed Steel & Pulley Company, Pittsburgh, has recently made large additions to its plant, which will enable it to make a much larger output of its Latshaw steel split pulleys for which there is an increasing demand. This company has appointed the following dealers as its agents for the sale of Latshaw steel split pulleys, each of which will carry a large and complete stock: W. F. Embree & Co., Lynn, Mass.; Babbitt, Wood & Co., New Bedford, Mass.; Corbett-Taylor Company, Trenton, N. J.; American Supply Company, Mobile, Ala.

### Philadelphia Machinery Market.

PHILADELPHIA, PA., January 8, 1907.

The year 1906 will go down in the history of the machinery trade as the greatest on record. The amount of business transacted in almost every branch of the trade has been unprecedented, and while the records of previous good years showed large productions that for the past year will exceed by a large percentage anything heretofore shown.

Manufacturers of machinery and machine tools entered the year with a good volume of business on their books. In December, 1905, orders for a large number of machine tools were placed in order to avoid advancing prices which were to become effective January 1, 1906. The probability of delayed deliveries was also an important factor at that time, and a good volume of business which in the ordinary course of things would not have been placed until the early spring was rushed ahead so as to get the advantage of more prompt shipments. As the year advanced this question of delayed deliveries became the main factor in the transaction of business, and as the volume offered increased so also did the time in which manufacturers were able to make shipments.

By far the greater portion of orders of any magnitude was placed during the first half of the year. In the latter half buyers found that it was impossible for them to place business in any quantity and get any kind of delivery, so the plan of breaking up their orders in small lots was largely adopted, and by placing the small orders where they could obtain the best of even the considerably delayed deliveries the aggregate time of delivery of equipment on the whole could be materially hastened.

#### Absence of Boom Conditions.

While the volume of business during the whole year has been large, the absence of so-called boom conditions has been particularly noticeable. It is no doubt true that prices were no particular object where quick delivery was concerned.

At the same time the boom feature was effectively lost by the fact that the manufacturer was booked so far ahead, and notwithstanding the price offered it was impossible to furnish the goods as desired. A noticeable feature in the year's business was the enormous volume of orders for single tools. Without doubt this class of business has been heavier than ever before, and is traceable no doubt to the fact that buyers picked up whenever the opportunity presented itself such tools as they were in need of. At times some purchaser who had placed an order early in the year for delivery, say six months later, found at about delivery time that he was unable to handle the tool. Under such circumstances no difficulty was experienced (if the tool was of standard type) in canceling the order, as the merchant or manufacturer had no trouble to make a resale, and as a rule at much more advantageous prices than was originally quoted, due to the prompt delivery of such a tool.

Deliveries, while considerably delayed during 1905, have been much more extended during the present year. Manufacturers during the latter months of the year would promise no better delivery, in some lines and sizes of tools, than 8 or 10 months. Six months' delivery was not at all uncommon, while the builders of tools in this vicinity who could supply desirable sizes within three or four months were decidedly scarce.

Why the manufacturer did not expand his productive capacity to meet the present day requirements has been a frequent question. Additional equipment has in many instances made the production of a number of plants considerably greater, but an important factor confronted the manufacturer should he undertake the material enlargement of his plant, and that was the inability to get tools to equip it. Minor plant extension has been quite large, and has been a good field for the smaller and medium tool equipment. Another field for tools in smaller quantities which has recently developed extensively has been that of garages for automobiles. With the more universal use of the automobile these have become quite numerous.

#### The Export Trade.

Domestic conditions the past year have been rather detrimental to the foreign trade, and the total volume transacted has not been very large. Manufacturers of the generally termed standard lines of machine tools have had such a rush of orders for domestic account that in many cases it has been impossible for them to give the foreign trade the attention it deserved, and the knowledge of such conditions has no doubt restricted inquiries to some extent in this territory. In the special tool lines, however, there has been a good demand and sales were largely increased. This has been particularly the case in file making machinery and in the special heavy tools for a variety of uses. The demand for special portable shop tools has also increased, and a considerable volume of business for export was transacted by manufacturers of those lines. A fair business was done in power equipment and in air compression machinery, while a largely increased demand is to be noted for power transmission equipment, such as pressed steel pulleys and shaft hangers, and manufacturers of these lines have materially increased the percentage of foreign trade during the past year, and are planning for a still larger volume during the coming year.

The greater portion of the export trade in this territory was made up of small lots of tools, largely orders for single tools, no very extensive propositions being offered. The exception to this, however, has been in the business transacted with the Isthmian Canal Commission for equipment in connection with the building of the Panama Canal route, and this cannot, strictly speaking, be termed export trade, although classified as such in some cases.

#### The Machine Tool Trade.

Unprecedented conditions have prevailed in the general machine tool trade throughout the entire year, the business transacted having been the largest in the history of the trade. Manufacturers, both large and small, operated their plants almost without exception at their best capacity in order to meet the demand. Such plants as had increased their facilities more or less extensively several years ago found them even with increased facilities inadequate for the present day needs, while those who endeavored to more completely equip their shops were hampered by the inability to get the desired equipment at a time when it could be used to the best advantage. The requirements of industrial plants of every description seemed to be greater than ever. The railroad companies were very extensive buyers of machine tools, probably not in as large lots as heretofore, but the number of tools in the aggregate reached a very large total. Steel works, car shops, structural works, rolling mills, boiler shops, and, in fact, every plant in which machinery was used in the fabrication of the finished product bought tools extensively.

The demand for heavy machine tools was exceptionally large. As the work of the large industrial plants has become heavier and heavier the necessity for tools of great capacity as well as weight was obvious, and to meet such requirements manufacturers have built a number of very large tools. Special tools, such as do not come under the

general head of standard machine tools, have been in greater demand than ever. In this age of specialization the tendency to get a tool which will do certain special work, to handle what has previously been done on some two or more tools, to save time or in any way decrease the cost of manufacture, has been an important matter, and builders of such special tools have had more business on their books than ever before. Where manufacturers have in connection with their regular line been manufacturing one or more of the so-called labor saving tools the increase in this particular branch of their business has in a number of cases been phenomenal.

Dealers have had a prosperous year, but have been largely handicapped by the inability of manufacturers to make deliveries. If it had been possible to get tools more promptly sales would no doubt have increased. Nevertheless, they have shown a large increase over those of the preceding year. Stocks on dealers' floors have been small. Tools for display purposes were hard to obtain, and while there was considerable reluctance on the part of the merchant to selling such tools, knowing well how hard they would be to replace, practically all the dealers were compelled at times to let such tools go in order to satisfy some of their customers.

#### Second-hand Machine Tools.

The combination of a large volume of business and the inability to get new tools for extension of plants, &c., forced the attention of the machine tool buyer to the second-hand machinery market in search of tools to meet his urgent needs. There was of course the natural demand which develops along certain lines for such tools, but the dealers in most cases were unable to meet the additional demand, particularly during the last half of the year, and some classes of tools became almost as scarce as new ones. Some manufacturers made quite extensive additions to their equipment, almost entirely from second-hand tools, and there was no difficulty experienced whatever on the part of the seller in disposing of tools of the usual standard types, which were of recent manufacture and which were at least in fairly good condition. Early in the year but little difficulty was experienced in obtaining such tools for prompt delivery, but when the demand became heavier dealers had some trouble in getting hold of the tools desired, and stocks were at times pretty low.

#### Boilers and Engines.

The demand for boilers and engines was good throughout the year, although at times somewhat irregular. Boilers in the higher powers for central power stations and for electrical power development had a good sale, while those of the medium powers were in good demand, and manufacturers in many cases were unable to make deliveries as promptly as desired by their various customers. The engine trade kept fairly good pace with the boiler demand. A number of propositions for large equipment were before the trade, while the business done in the medium powers was fully up to the average and in some cases exceeded it, and most of the engine builders were fully occupied. In some lines the demand for engines and boilers was offset by the use of electricity, the current being supplied by the local electrical plants, and in other cases by the installation of gas and gasoline engines and oil engines of the higher powers.

The small engine and boiler trades were not as active as might be desired. Electric power, gas and gasoline engines have been pushing rapidly forward as mediums of power in the smaller plants and have had a large sale, and in many cases have replaced the smaller engine and boiler power equipment.

#### Locomotives.

There was a largely increased demand for locomotives, and the local plant has been continuously rushed to make deliveries desired. During 1906 the Baldwin Works delivered approximately 2610 engines, or an average of over eight locomotives per day for 310 working days. This is an increase of more than 15 per cent. over that of the previous year. The railroads have been the heaviest buyers, although there has been a slight increase in the demand from industrial works. Sales of locomotives for foreign account increased over the preceding year. The tendency during the year has been toward the heavier types of engines, although there has been a large demand for engines of the intermediate types for branch line work. At no time during the past year was the local works without orders for its capacity at least four months ahead, while it enters the new year with fully six months' business on the books.

#### Shipbuilding.

The Delaware River shipyards have had a most prosperous year, and have operated their plants continuously at the best capacity. A large amount of work was carried over from the previous year, and the demand in 1906 was better than for some time. The local yards were successful in obtaining contracts for battleships and other war vessels for the United States Government, a number of merchant steamships, both for passenger and freight service, and a large number of vessels for the inland water trade. The aggregate amount of business on the books of the various

yards is very large, and it looks most favorable for a continuation of the present prosperous conditions in this industry.

#### Prices.

Several regular advances in the prices of machine tools were announced during the year. These usually were made at a rate of from 5 to 10 per cent., and in several instances two and even three such advances were made during the year.

Even at the higher selling prices some manufacturers contend that the margin of profit to-day is not as high as it should be when the amount of capital invested and the prices paid for labor and materials are taken into consideration. What the outcome will be for prices during 1907 is problematical. If the demand continues active, and particularly should costs go higher, either from advanced prices of materials or wages, there is no doubt that further advances will have to be made to cover the increased costs. Premiums will no doubt be offered for prompt deliveries, but these can scarcely be considered in the light of advanced prices.

#### Iron and Steel Foundries.

The ability or the inability to obtain iron and steel castings for machinery parts as desired has in a great many cases affected deliveries. The foundries have had a very active year, the amount of business offered aggregating the largest tonnage ever known in the trade. The principal difficulty, however, was the inability of the foundries to handle the business offered. This was not altogether the case of insufficient capacity, but many of the gray iron foundries were unable to use their capacity to its full tonnage. In the closing months of 1905 a number of Philadelphia gray iron foundries had to contend with a strike of the coremakers and molders. This strike, while eventually defeated, had a pretty general influence on production during the early months of the year, and in individual cases for even a longer period, but its effect decreased as the year advanced, and during the latter portion of the year the foundries produced as great a tonnage if not even greater than ever before. In this fight the open shop principle was an important issue, and the use of the molding machine was widespread.

Steel casting plants were unable to handle the business offered with the facilities at hand, and extensions and increased furnace capacities were in order throughout the year. The idle plant of the Delaware River Steel Casting Company, Chester, Pa., was purchased and put into operation during the year by the Federal Steel Casting Company, while the plant formerly occupied by the Brylgon Steel Casting Company at Reading, Pa., was taken over and is being operated by the Reading Steel Casting Company.

An important item in the delivery of both gray iron and steel castings, particularly the last half of the year, was the difficulty experienced in obtaining prompt supplies of raw materials. Pig iron was scarce, the consumption at times being greater than the production. The various advances in the prices of raw materials brought advanced prices in castings, which are in many instances, even at the present level, thought to be too low in view of the prices paid for materials and labor.

#### Improvements to Plants.

Generally speaking, manufacturing plants have not increased their productive capacity the past year in proportion to the increase in the demand. The possibility of over-expansion is a chance which but few seem to be willing to take. Quite a number of manufacturers, however, largely increased their productive capacities by extending their plants. In other cases modern and more efficient tools replaced those of the older and antiquated types, and the productive capacity was increased in this way. Minor extensions to various plants were made in great number for every variety of purpose. The railroads made extensive additions both to plants and equipment.

The Baldwin Locomotive Works purchased machinery and machine tools for re-equipment and extension in enormous quantities, while also purchasing a large amount of equipment for its new foundry and smithshops at Eddystone, Pa. The company purchased early in the year the plant of the late Gruson Iron Works, the capacity of which has been largely increased, so as to enable the company to manufacture the greater part of the gray iron castings which had formerly been purchased from outside foundries. The local foundry was abandoned, and on its site a new erecting shop was begun. In addition to the foundry a large smithshop has been built and equipped at the Eddystone Works, while the brass foundry will also be transferred from the local shops to that point.

The city of Philadelphia has been a very large buyer of equipment for its new filtration plant at Torresdale, together with equipment for its various new pumping stations and systems for the distribution of filtered water in the various sections of the city.

The John A. Roebling & Sons Company, Trenton, N. J., completed the erection of a large plant for the manufacture of its various products, at Roebling, near Kinkora Junction, N. J., where, in addition to the plant, a model town was built. At this plant the company has built three 30-ton and



one 50-ton acid open hearth steel furnaces, and a complete blooming and rod mill, the latter having an ultimate capacity of 250 tons of rods per 10-hr. turn.

The Philadelphia Rapid Transit Company has in course of construction at Delaware avenue and Laurel street, in this city, a new power plant which when completed will be, it is said, the largest of its kind in this country. This plant will furnish all the energy for the operation of the subway and elevated railroad systems of the company now in course of construction.

Eddystone, Delaware County, Pa., located about 12 miles from Philadelphia, has the record for new plant erection during the past year in this territory. At this place, in addition to the rehabilitation and large extensions of the Gruson Works plant by the Baldwin Locomotive Works above mentioned there have been erected, or are in course of erection, additions to the new plant of the Belmont Iron Works and the High Duty Saw & Tool Company. The Pennsylvania Iron Works Company has started the erection of a new plant for the manufacture of gas engines at this place, and Henry A. Hitner's Sons will also erect a plant there for the handling of heavy scrap material of all classes.

Practically all of the large iron and steel mills in this territory have made extensive additions to their plants to meet the demand for finished material. Additional melting and rolling capacity for the manufacture of steel plates and shapes has been installed, and still the plants are not able to meet the demand for prompt shipments.

#### The Outlook for 1907.

From present indications it is the general opinion that the prosperous conditions which have been experienced by the trade the past year will be continued in 1907. Manufacturers in almost every branch of the trade have enough business on their books to keep them fully occupied for months, and on some lines and sizes of tools it will be practically impossible to make deliveries earlier than the second half of the year. This would indicate in itself a good volume of business already in hand, but this will be greatly augmented from a variety of sources. The railroads will no doubt be large buyers of tools. Those located in this district have not yet presented their lists for 1907 to the trade. Quite a lot of tools will be needed for new plants, and several quite large ones are now in contemplation, some of which are known to be practically decided upon.

The requirements of the general manufacturing plants for replacement of equipment will no doubt be large. The continuous driving of machine tools at their utmost capacity, in many cases from 18 to 20 hr. per day, has its effect on their length of service, and when the effectiveness of the tool reaches a point where it is cheaper to disregard the tool in question and to purchase a new one there is no hesitancy displayed in making the purchase. Under the conditions which have prevailed the past year, however, it has been impossible in many cases to pursue that policy, and many tools have been maintained in service at a low efficiency because new tools could not be had.

#### The Week.

The American Pipe Mfg. Company, Fidelity Building, this city, will receive proposals until January 15, 1907, for the construction of a water power plant at Nanticoke, Pa., to furnish electric power in Wilkes-Barre and vicinity. A masonry power house is to be erected, head and tail races built, a timber dam being already at the site. The plant will develop between 5000 and 6000 hp., and the equipment is to consist of vertical shaft turbine wheels with a dynamo for each pair of wheels, there being seven units in all.

The Hilles & Jones Company, Wilmington, Del., considerably increased the facilities of its plant during the past year, adding a number of the latest tools designed for high speed steel work. To meet the constantly increasing demand for its tools, however, this company will still further increase its plant and has recently contracted for the erection of a new shop 60 x 200 ft., new tools for the equipment of which are now being purchased. This company is also erecting a new building 50 x 100 ft. for storage of patterns used in its foundry department. Business conditions are reported by the Hilles & Jones Company to be in very satisfactory shape, with the outlook for a good business during the present year.

Bridgman Bros. Company, manufacturer of steam fitters' supplies, has let a contract for the erection of a new factory building at Fifteenth and Washington avenue. The building will be of brick and concrete, 90 x 100 ft., four stories high, and is being erected to accommodate other departments, now separated, under one roof. The greater part of the equipment is already provided for, being now in use at the other plants. The power plant, however, has not yet been provided for, and it is undecided whether gas, steam or electricity will be used.

*Stahl und Eisen*, Düsseldorf, the excellent technical journal of the German iron industry, heretofore semi-monthly, appears as a weekly beginning with January 1.

## New England Machinery Market.

WORCESTER, MASS., January 8, 1907.

The machinery dealers of Boston seem to have had a variety of experience in the first week of the new year. The majority report that business has been rather duller with them than during last month, while a few have found exactly the reverse condition, the week having been better than the average of December. However, business is good enough for every one, the comparison meaning little, except as it indicates relative conditions. A better comparison is given by one of the dealers, whose sales in answer to mail quotations so far in 1907 have practically equaled the total of mail quotation sales for the entire year of 1903.

Hill, Clarke & Co., Incorporated, state that their Chicago office had in December the largest month's business in the history of either that or the Boston branch in 15 years.

The tendency to advance prices continues, though nothing in the way of a general increase is yet announced. Some of the shapers have gone up. Dealers have been notified that their discount on planer chucks has been reduced 10 per cent. O. S. Walker & Co., Worcester, announce an advance on their magnetic chuck.

Some of the dealers have again become anxious concerning further advances in prices. They believe that the market should be left alone, that every effort should be made to cultivate a continuance of the present demand, and fear that to press prices above the present point may result in a reaction. Their point of view is very different from that of the machine tool builders, who would be well satisfied to see a slight falling off of business, which is all that they would expect in the way of a reaction should they again advance prices.

The plans of the new Boston & Providence Interurban Electric Railway Company, which proposes to build a line connecting the two cities, call for large outlays in the way of power equipment, rolling stock and rails. The specifications as filed with the Massachusetts Railroad Commission contain among other items \$774,000 for power stations and their equipment, \$650,000 for rolling stock of all descriptions, \$248,140 for 8203 tons of steel rails, and correspondingly large sums for bridge and trestle work, including \$55,570 in the city of Boston alone. The company has a charter granted by the Massachusetts Legislature, and now awaits the permission of the Railroad Commission. The plan is promoted by the Gaston-Shaw-Stone & Webster interests, which include the well-known houses of James F. Shaw & Co., 8 Congress street, and Stone & Webster, 84 State street, Boston.

F. R. Woodward, Hill, N. H., proprietor of the New England Novelty Works of that place, which were recently destroyed by fire, states that he will rebuild the factory and will require new machine equipment, including lathes and planers. The fire caused a total loss.

An instance of the present tendency to discard the less popular sizes of lines of machine tools, with the intention of concentrating upon those tools for which the demand is greatest, is afforded by the announcement of the Colburn Machine Tool Company, Franklin, Pa., just made to the dealers, that prices on its 30-in. boring mill are withdrawn because of the increasing preference for the company's 34-in. machine.

The La Pointe Machine Company, Hudson, Mass., has given to Hill, Clarke & Co., Inc., the agency for its line in an extensive territory.

The George G. Prentiss Company, New Haven, Conn., manufacturer of multi-spindle automatic turret machines, is to make large additions to its plant, with the intention of increasing it to a little more than double its present capacity. The company will be in the market, a little later, for a long list of machine tools. The list will be of a miscellaneous nature, and will include somewhat more tools than are now included in the very considerable shop equipment. The business of the company has grown very rapidly. Less than a year ago a very important increase in capacity was secured by the purchase and occupancy of the present modern shop building, but to-day there is need of very much larger productive capacity, and consequently the enlargement was decided upon. The company has just been incorporated under Connecticut laws with capital stock of \$500,000. George G. Prentiss is the president and manager; Harvey M. Prentiss, treasurer, and Thomas C. Stirling, secretary.

The Standard Bolt & Nut Company, a new corporation, is to establish a factory at Valley Falls, R. I., and will be in the market for quite a large amount of new equipment. Forging machines, presses and threading machines will be required, and machine tools, the list of which will be ready in a short time. It is not decided what power will be employed, the matter being now under discussion. Either electric motors, run by power purchased from another power plant, gas engine or steam engine will be installed, with the present inclination in favor of electricity. A one-story wooden building will be erected, 40 x 112 ft., with wing

40 x 72 ft. Alexander Leslie, Lincoln, R. I., is the president, and Albert H. Humes, Pawtucket, R. I., treasurer. Mr. Humes is an architect and has prepared the plans. The town of Cumberland, of which Valley Falls is a part, has granted the company a tax exemption for a term of 10 years.

In view of the large demand for machinery and the inability to secure reasonable deliveries on tools, it is probable that buyers from many points in the East will go in large numbers to New Haven, Conn., January 10, with the hope of securing the mechanical equipment of the plant of the W. S. Burn Mfg. Company, which is to be sold at auction that day by J. E. Conant & Co. This equipment includes quite a number of machine tools of standard make, many of them comparatively new, and as in many cases buyers are willing to pay premiums for early delivery, it will not be surprising if these tools bring in some instances higher prices than those listed by the manufacturers for new tools, as was the case in the sale some months ago of the equipment of the Shaw plant, Lowell, Mass. The equipment to be sold includes Niles-Bement-Pond Company 8-in. bench lathes, 11-in. speed lathes, universal grinder; Pratt & Whitney 12-in. tool makers' lathe, No. 1 hand screw machine, No. 2 hand screw machine, No. 3 screw machine, automatic screw machine, No. 1½ hand milling machine, 7-in. precision lathe; Brown & Sharpe universal milling machine, No. 2 hand screw machine, Hendey 16-in. screw cutting engine lathe, 24-in. shaper, 12-in. screw cutting engine lathe; Gould & Eberhardt 12-in. high duty shaper, Blaisdell 17-in. screw cutting engine lathes, 12-in. upright drill; Sigourney 12-in. sensitive drills, New Haven 24 x 24 in. planer; Sloan & Chase 7-in. precision lathe; Boynton & Plumber shaper; Bliss No. 18 tilt-over power press; Barnes 20-in. upright drill; also power hammers, blanking presses, arbor presses, motors and a large number of other tools.

### Cleveland Machinery Market.

CLEVELAND, OHIO, January 8, 1907.

The demand that is being made on local machinery manufacturers for hoisting and conveying machinery for iron and coal mines is very heavy at present, and the makers are unable to keep up with the orders. As a rule, purchasers are anxious for prompt delivery. All makers of machine tools report that their plants are working to their fullest capacity, but that they are unable to keep up with the demand.

Dealers in machinery and machine tools report that the slight lull that appeared during the holiday season has passed away, and that numerous inquiries are now coming in. The orders, for the most part, are for one or two machines for additional equipment. Dealers expect a very heavy demand for machine tools of all kinds during the next two or three months.

The plant of the Mansfield Engineering Company, Mansfield, Ohio, which has been in the hands of a receiver for some time, has been purchased by the Browning Engineering Company, Cleveland. The consideration given in the deed was \$75,000. Some new equipment in the way of machine tools will be installed. These for the most part have already been purchased. The Browning Company will also largely increase the capacity of its Cleveland plant, where it has just built a blacksmith shop and will erect a new structural building, 60 x 400 ft., in the spring. The company reports a heavy demand for engine cranes. It will use its Mansfield plant for the manufacture of wrecking cranes, which, with the Ravenna, Ohio, plant purchased a few months ago, will double the company's capacity.

The Cleveland Punch & Shear Works Company is extending its plant by the erection of an addition for the manufacture of small tools. The new building will be 80 x 156 ft., two stories high, and of steel and concrete construction. The company has just purchased 15 new pieces of machinery, mostly screw machines and lathes. The new addition will be ready for operation, it is expected, on June 1. Three large orders have been received during the past two weeks for the complete equipment of three new plants, also a large number of smaller ones.

The Burke Machinery Company, manufacturer of bench milling machines and drill presses, has recently completed a new factory at Thirty-fifth street and Perkins avenue. The main building is 60 x 130 ft., one story, with a second story annex for offices and drafting rooms. The company has put in a new planer, lathes and grinders, and the capacity of the plant is double that of the old one. The plant is being run at its full capacity, and the company reports that it cannot keep up with orders.

The Star Drilling Machine Company, Akron, has just received an order from the United States Government through the Panama Canal Commission for 41 well drilling machines, to be used in the excavations at Culebra, for the purpose of drilling holes for blasting. Some of the machines will also be used for drilling wells, to establish water works systems at different places along the canal. The machines are to be accompanied by full sets of tools, boilers and en-

gines for each outfit. The amount of the order is \$30,630.75. The first shipment will be made in about a month.

The Globe Machine & Stamping Company has recently made the following additions to its plant: Shumacher & Boye engine lathe, Smith & Mills shaper, Knecht drill, Waterbury hydraulic press and pump and Ferracute double-acting triple-gear press weighing about 20,000 lb. This company intends to purchase a 16-in. engine lathe.

The Wellman-Seaver-Morgan Company is well filled with orders for ore conveying machinery, and reports a good demand for the Hughes continuous gas producers, which it is now manufacturing. This company has recently installed some new boring mills and other machinery.

The Timken Roller Bearing Axle Company, Canton, Ohio, is in the market for about \$5000 worth of machine tools, including lathes and drill presses. A large part of the purchases, it is expected, will be made this week.

The Tudor Boiler Mfg. Company, Cincinnati, Ohio, is in the market for hydraulic and pneumatic compression riveters, also additional punching and shearing machinery to be delivered early in the spring.

### Government Purchases.

WASHINGTON, D. C., January 8, 1907.

The Isthmian Canal Commission will receive bids until January 18, Circular No. 347, for electric light plant equipment, electric cranes, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until January 22 for air drills, polishing lathes, superheaters, pneumatic hoists, speed lathe and other material for the Eastern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 19 for the following machine tools for the Mare Island Navy Yard: Electric traveling crane, engine lathes, turret lathe and sprue cutter.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 5 for the following machine tools for the Eastern navy yards: Schedule 352, dump cars, electric traveling crane; schedule 353, side crank steam engine; schedule 354, horizontal steam steering engines, radial drilling and countersinking machine.

Bids will be received until January 24 at the West Point Military Academy, West Point, N. Y., for an electric traveling crane.

The following bids were opened December 22 for four electric traveling cranes for the Portsmouth Navy Yard:

The Case Mfg. Company, Columbus, Ohio, two three-motor 15-ton cranes, \$3825 each; one four-motor 40-ton crane, \$8825; one four-motor 25-ton crane, \$5850.

Pawling & Harnischfeger, Milwaukee, Wis., one 40-ton crane, \$8300; one 25-ton crane, \$5100; two 15-ton cranes, \$6700; all four cranes, \$20,000.

The Cleveland Crane & Car Company, Wickliffe, Ohio, 40-ton four-motor crane, \$8410; 25-ton four-motor crane, \$6825; two 15-ton three-motor cranes, \$6200.

The Northern Engineering Works, Detroit, Mich., two 15-ton three-motor cranes, \$8180 for both; one 25-ton four-motor crane, \$6915; one 40-ton four-motor crane, \$11,690.

The Modern Steel Structural Company, Waukesha, Wis., all four cranes, \$25,500.

The Niles-Bement-Pond Company, New York, all four cranes, \$18,000.

The following bids were opened December 26 for equipment for the Capitol power plant:

Section A, 2000-kw. steam turbo engines and alternators; section B, cross compound steam engine; section C, engine driven alternators; section D, 75-kw. engine driven exciter generators; section E, exciter storage battery; section F, synchronous motor generator sets; section G, switchboard and power station and substation machine wiring.

Bid A, for the entire equipment described in sections A, D, E, F and G; bid B, for the entire equipment set forth in sections B, C, D, E, F and G; bid C, for the equipment of machinery and accessories for power house as set forth in sections A and B; bid D, for equipment of machinery and accessories as set forth in sections B, C and D; bid E, for the exciter storage battery equipment and accessories set forth in section E; bid F, for the motor generator sets set forth in section F; bid G, for the entire equipment of switchboard and power house and substation machine wiring as set forth in section G.

Muralt & Co., New York, bid A, \$550,183, alternate for entire equipment as described above by substituting stationary transformers, \$456,956; bid B, \$532,721, alternate for the entire equipment described above by substituting stationary transformers, \$439,494.

The General Electric Company, Schenectady, N. Y., bid A, \$544,877.

The Providence Engineering Works, New York, bid D, \$239,200.

The Electric Storage Battery Company, Philadelphia, Pa., bid E, \$14,078; alternate, \$13,728.



The Gould Storage Battery Company, New York, bid E, \$15,625.

The Westinghouse Electric & Mfg. Company, New York, bid A, \$533,728, 12½ calendar months; bid C, \$240,174, 10½ months; bid E, \$14,158, 7 months; bid F, \$177,576, 12½ months; bid G, \$101,820, 7 months.

The McIntosh & Seymour Company, New York, bid D, \$263,335, 8 months.

### The Carter Iron Company.

The properties of the Monongahela Iron & Steel Company, Pittsburgh; Ohio Valley Steel Foundry Company, Paden City, W. Va.; New River Mineral Mining Company, Abingdon, Va., and the Ivanhoe Furnace Company, Ivanhoe, Va., have been consolidated under the name of the Carter Iron Company, with a capital of \$700,000 and general offices in the Park Building, Pittsburgh.

The plant of the Monongahela Company occupies a site of about 12 acres, having a good frontage on the Monongahela River and railroad connections with the Baltimore & Ohio, Pennsylvania and New York Central roads. The product is high grade bar iron and chain. The New River Mineral Mining Company's property consists of 800 acres fronting on both sides of the New River, with blast furnace, ore mines, &c., which will afford the Carter Iron Company facilities for manufacturing its special brands of high grade pig iron. The ore mines at Abingdon, Va., contain about 900 acres, which, together with other ore properties, insures the company a supply of ore for its furnaces. A few months ago the plant of the Ohio Valley Steel Foundry Company was purchased by R. A. Carter and this is also included in the merger. This plant has a frontage on the Ohio River and is equipped for making low phosphorus melting bars, sheet iron, roofing, &c. By the combination of interests the Carter Iron Company is in a position to make its brands of iron directly from its own ores.

One of the principal features at the rolling mills at Hays, Pa., and Paden City, W. Va., is the installation of the Carter improved puddling furnace, which is said to yield 60 per cent. more product than the ordinary furnace and to make a more reliable and uniform quality of iron. The Carter brands of bar iron are favorably known for their superiority and are used by many railroads, &c., for special work. The company also controls the patent of R. A. Carter on a link bending machine, which is being used extensively by chain manufacturers throughout the country, and which has been adopted by the United States Government. The machine makes chains ranging from the smallest sizes up to ¾ in. in diameter. The links formed are almost perfect and require little work to weld them together.

The new management of the Alabama Consolidated Coal & Iron Company was elected January 2, when the following were chosen directors: D. G. Boisevain, Richard H. Edmonds, James A. Green, Edward K. Hill, Joseph H. Hoadley, Guy R. Johnson, Walter H. Knight, Kenneth K. McLarren and William G. Seddon. Mr. Hoadley subsequently was selected by the directors to succeed Col. T. G. Bush as president, and the control of the company is now vested in the International Power Company, of which Mr. Hoadley also is president. Guy R. Johnson, late managing director of the Red River Furnace Company, Clarksville, Tenn., has been made general manager of the Alabama Consolidated Company.

The Monongahela River Consolidated Coal & Coke Company, Pittsburgh, will begin shipping coal to Havana, Cuba, on the first rise of the Monongahela River this year. These will be the first coal shipments by water from the Pittsburgh District to Havana. Twelve steel barges, 48 x 200 ft. and 8 ft. deep, holding 12,000 bushels of coal each, have been constructed for this trade.

Riverside Furnace of the National Tube Company at Benwood, W. Va., made 13,319 gross tons in December, being 410 tons greater than any former monthly record. The furnace has been reduced in height from 115 to 110 ft., and the best record made with the stack 115 ft. high was 12,909 tons, last October.

### CONTENTS.

	PAGE.
Development of Tunneling in New York City. Illustrated..	119
The Dahl Automatic Drill Grinder. Illustrated.....	128
The Gravity Molding Machine. Illustrated.....	130
The Westinghouse Interests.....	132
The Fulton Foundry & Machine Works. Illustrated.....	133
The Wadsworth Multiple Core Machine. Illustrated.....	136
Uehling Pyrometer Improvement. Illustrated.....	136
Fluctuations in the Prices of Iron and Steel Products, 1898-1906. (With Supplement.).....	138
E. P. Bullard. Portrait.....	139
Obituary .....	139
Editorial:	
The Repair Account for Steel Cars.....	140
Publicity of Machine Tool Lists.....	140
A Cure for the Absent and Tardy Habit.....	141
Trade Agreements.....	141
Correspondence:	
Corrosion of Steel in Cinder Concrete.....	141
Facts About the Mexican Iron Industry.....	142
The Philadelphia Foundrymen's Association.....	143
Personal .....	143
November Iron and Steel Exports and Imports.....	144
Progress of the Heroult Process.....	144
The Baldwin Locomotive Works' Largest Year.....	144
Pig Iron Production in December.....	145
News of the Works:	
Iron and Steel.....	146
General Machinery.....	146
Power Plant Equipment.....	147
Foundries .....	147
Bridges and Buildings.....	147
Fires .....	147
Hardware .....	147
The Iron and Metal Trades:	
A Comparison of Prices.....	148
Chicago .....	148
Birmingham .....	150
Philadelphia .....	150
Cincinnati .....	151
Pittsburgh .....	152
Cleveland .....	153
New York.....	154
Metal Market.....	155
Iron and Industrial Stocks.....	155
The Benson Mines Leased.....	156
The International Rail Syndicate.....	156
New Railroad Construction in 1906.....	156
The Machinery Trade:	
New York Machinery Market.....	157
Philadelphia Machinery Market.....	158
New England Machinery Market.....	160
Cleveland Machinery Market.....	161
Government Purchases.....	161
The Carter Iron Company.....	162
Hardware:	
Condition of Trade.....	163
Notes on Prices.....	164
National Convention for Extension of Foreign Commerce of the United States.....	166
Price-Lists, Circulars, &c.....	167
Trade Items.....	167
Trade Winning Methods.....	168
The Post Office Appropriation Bill.....	169
The Consolidated Handle Company.....	169
Death of Andrew Corbin. Portrait.....	170
Calendars, &c.....	170
J. H. Williams & Co.'s Drop Forging Plant. Illustrated.	171
Manufacturers at Richmond.....	171
Pacific Federation of Hardware and Implement Associations Proposed.....	172
Glidden Varnish Company's New Plant.....	172
Request for Catalogues, &c.....	172
Annual Dinner of Logan-Gregg Hardware Company....	173
Chinoline Refrigerators.....	173
Adler Pressed Steel Step Ladder. Illustrated.....	173
Walden Ratchet Tire Bolt Wrenches. Illustrated.....	173
Imperial 3-Coin Bank, Self-Registering. Illustrated....	174
The Diamond Hunting Hatchet. Illustrated.....	174
The Sawyer Surface Gauge. Illustrated.....	174
Standard Two-Tier Lockers. Illustrated.....	175
The Standard Wagon. Illustrated.....	175
Smith's Improved Rat Traps. Illustrated.....	176
New Ideal Metal Gas Check Bullets. Illustrated.....	176
The Zephyr Window Ventilator. Illustrated.....	176
Chicago Recording Time Lock and Bolt. Illustrated....	176
The Arcade Detachable Holdback Spring Hinge No. 80. Illustrated .....	177
Current Hardware Prices.....	178

# HARDWARE

**T**HERE are many evidences that Hardware merchants to a much greater extent than ever before have during the past month or two taken advantage of the opportunities afforded by the holiday season to push numerous goods comprised in an up to date Hardware stock which admirably serve as useful and handsome Christmas gifts. Not a few bold and aggressive merchants went even further, and took up for the time being the sale of goods a little aside from the usual Hardware line, but, nevertheless, harmonizing very well with it. Reports in regard to the business done in what may be termed holiday articles are with scarcely an exception of a very satisfactory character.

Merchants who have put forth special efforts in this direction have as a rule been well repaid, this being particularly the case where appeals were made for the trade of the ladies. With many Hardwaremen, owing largely to this tendency, the months of November and December have taken their place among the busiest months of the year. It is gratifying to be able to record these efforts on the part of retail merchants to avail themselves of the opportunity to extend their business. It augurs well for their future success and prosperity.

It will be well for those who continued on the old lines during the holidays just passed to look carefully into the advisability of adopting another policy the present year and bringing into their stores a class of the fancier and finer articles which will render them attractive to a new class of buyers and yield at the same time more than the average percentage of profit.

The House Committee on Post Offices and Post Roads has just begun a series of hearings on the annual Post Office Appropriation bill, which will probably continue a fortnight. At their close the committee will proceed to draft the bill, which will probably be reported to the House about February 1. During the next three weeks, therefore, the committee will have an opportunity to hear from all persons interested in postal legislation, and the retail Hardware trade should certainly acquaint Chairman Overstreet and his colleagues with their views regarding the numerous projects in the interest of the catalogue houses that are now being urged upon the attention of the committee with greater energy than ever before in the history of this movement. It will be too late to take effective action after the bill has been reported, but much can be done by timely representations on the part of State and national organizations.

Manufacturers and indeed merchants also, both wholesale and retail, are frequently prevented from announcing higher prices although justified by increased cost because their competitors refuse to act with them in this matter. In many cases the makers of goods have relatively low cost material on hand or contracted for at less than current rates and are thus enabled to avoid an immediate advance in price. The merchants, too, on their part have stocks of goods purchased at less than ruling rates, and so long as they are selling them at a reasonable profit do not always think it well to advance their prices to the basis of present cost. Whatever may

be thought of the policy thus pursued, and there is something to be said on both sides of the question, this disposition must be recognized as one of the beneficent forces which militate against too rapid advances in prices. There are many evils connected with the effort of manufacturers, jobbers or retailers to make an undue profit, and the refusal on the part of manufacturers and merchants to put up prices must be regarded as having an excellent effect in general, while diminishing for the time being at least the profit realized by them and their competitors.

## Condition of Trade.

While there is a disposition on the part of the trade to slacken a little the pace which has kept up so long and so strenuously, and to take breath before entering on the active prosecution of the business of the new year, the condition of the market has been such as to give little opportunity for such relaxing of effort. January, the opening days of which are generally characterized by a moderate volume of business, has this year witnessed an exceptionally large trade, as many new orders have been booked. These orders in some cases are to replenish depleted stocks, but there have been also many purchases relating to future requirements and covering round quantities of goods. Manufacturers continue to be troubled by difficulty in getting material and with some of them this is the cause of a good deal of embarrassment. Many advances, some of which are referred to in the following columns, are taking place from day to day so that the Hardware commodities which have not changed in price are few and far between. In view of the uncertainties of the market manufacturers are more conservative than for a long time and many orders are accepted subject to prices ruling at the time of delivery. Delays in transportation owing to shortage of cars and equipment and the overtaxing in some cases of the capacity of the roads occasion constant annoyance to both manufacturers and merchants. The general feeling on the part of the trade is that a large business is assured for the first half of the year at least, with a probability of its continuance provided there is no reason for a serious setback resulting from an important shortage in the crops. To what extent and how soon the higher range of prices and the increased cost of living are going to result in putting on the brakes to commercial activity and industrial enterprise is a question which will continue to be canvassed by close students of the situation.

### Chicago.

Price advances, affecting many Hardware lines, were announced the first of the year, but it is still too early to ascertain how they will be received by the retail trade, as the representatives of both manufacturers and jobbers have only just returned to their respective territories. Local distributors do not anticipate any considerable buying before the middle of the month at least, and no revival of activity, such as characterized the closing months of the year, until well along in February when the first of the spring buying begins. Stocks in the hands of jobbers and manufacturers' representatives have been replenished during the past two or three weeks, and shipments can be made more promptly than at any time in the last six months. For this reason the holiday season was welcomed, as the manufacturers, with few exceptions, were enabled to make inroads on their accumulated orders.



The mild weather, which continues to prevail throughout this section, permits building operations to proceed without interruption, and all lines of Hardware required in this work are unseasonably active. In the Northwest, however, the weather is unusually severe, and buying has to a large extent been curtailed. Practically all lines of Mechanics' Tools were marked up 10 per cent., including Saws and Hatchets, while Stanley Rules and Levels were advanced from 5 to 15 per cent. Cabinet Locks, Hand Bells and Gongs were also increased in price an average of 10 per cent., while Shovels and Spades were moved upward the same amount. The advance of 10 per cent. on Tacks was unexpected, and is undoubtedly directly due to the increased cost of raw material.

### NOTES ON PRICES.

**Wire Nails.**—The largest producer is from four to five weeks behind on deliveries, with its warehouses practically bare of goods, while stocks in jobbers' hands throughout the country are reported as being low. Southern jobbers are beginning to place orders on which deliveries should begin within a month, and by that time the trade further North will be calling for shipments. There appears to be little likelihood that the supply can be made to equal demand for the next three months. Scarcity of steel and car shortage are interfering with shipments from mill, while congestions and embargoes on railroads are delaying receipts of goods which were shipped some time ago. Prices are firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

**New York.**—Local demand is not particularly heavy, a usual condition at this season. While there are some low priced stocks of Nails at this point, the regular jobbers seem to prefer to lose sales rather than to meet this temporary competition, as it is expected that it will be difficult to get Nails to replace present stocks in the near future. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots, at store, \$2.30.

**Chicago.**—While the volume of new tonnage since the first of the year has been light as compared with the same period last month, nevertheless there has been no decline in the volume of specifications, and shipments are still being prorated. Production is curtailed on account of the inadequate steel supply, and the lessened output is not favorable to improved shipments in the near future. Prices are firmly maintained as follows: \$2.15 in car lots to jobbers, and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

**Pittsburgh.**—Demand for Wire Nails is more active than usual at this season of the year, while specifications on contracts are coming in very freely. The car shortage in the Pittsburgh District is being very severely felt, the American Steel & Wire Company and the Pittsburgh Steel Company being unable to obtain a full supply of cars and are very much behind in shipments. Stocks of Wire Nails held by jobbers are very low and are badly broken. All indications point to an enormous volume of business in the Wire Nail trade this year, and which will probably exceed last year. Prices are firm, and in some cases the smaller independent Wire Nail mills are asking slight premiums for prompt shipment. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

**Cut Nails.**—The next meeting of the Cut Nail Association is scheduled to be held in Philadelphia on January 16. It is anticipated that no change in prices will be made at that time. The mills are still considerably behind in their orders, while stocks in manufacturers' and jobbers' hands are light. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to

retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**New York.**—Demand at this point is not active, as building operations are not being pushed to any great extent. The regular jobbers are generally allowing low priced stocks to be absorbed, rather than make concessions in price necessary to secure this business. Jobbers' regular quotations are on the basis of \$2.30 for small lots at store.

**Chicago.**—Current demand shows no decline, and shipments from Eastern mills are insufficient to meet the requirements. Consumption has been stimulated by the favorable weather which permits outdoor building operations to be carried on without interruption, and considerable tonnage is being diverted to the Wire Nail mills owing to the limited stocks that are being carried by Western distributors. Quotations are unchanged, as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

**Pittsburgh.**—The mills are unable to supply Cut Nails as fast as wanted by their customers, and are very much behind in deliveries. Stocks held by the mills and jobbers are much lighter than usual and are badly broken. Several of the Cut Nail mills have their product sold up for two or three months, and cannot promise deliveries prior to April. The continued shortage in supply of cars is greatly retarding shipments. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**Barb Wire.**—Jobbers who placed contract orders during December are urging prompt shipments so as to accumulate stocks for spring business. The specifications are in excess of the daily productive capacity of the mills, while the shortage of cars adds to the difficulty of complying with the requests to hurry forward the goods. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Chicago.**—Specifications from jobbers, who are anxious to accumulate stocks for the spring trade, are heavy and exceed the daily producing capacity. New tonnage since the first of the year has, however, been comparatively light. We quote: To jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, Bright, in car lots, \$2.25; Galvanized, \$2.55; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—Tonnage placed with the mills in December for spring trade was unusually heavy, and this month promises to be fully as large. Stocks held by jobbers are very light, and they are insisting on prompt shipments by the mills in order to have as large stocks on hand as possible when spring demand starts. The mills find difficulty in making deliveries, owing to shortage of cars. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Smooth Fence Wire.**—Specifications on contract orders are being received by the mills in large volume, and mills have not yet been able to catch up with their orders. New business is light, owing to the heavy orders placed some time since. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....	\$1.85
Retailers, carloads .....	1.90

The foregoing prices are for base numbers, 6 to 9.

The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

**Chicago.**—There has been no decline in the volume of specifications since the first of the year and consumption continues at a record rate. Little new business is being placed, as shipments are largely being made on contracts placed during the summer months. Quotations are unchanged, as follows: In car lots, to jobbers, \$2, f.o.b. Chicago, and to retailers, \$2.05.

**Pittsburgh.**—While new business is light, specifications on contracts placed some time ago are coming in very freely, and all the mills are behind in deliveries, owing to heavy demand and shortage in cars. Some of the smaller independent mills continue to ask slight premiums in prices for prompt delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....	\$1.85
Retailers, carloads .....	1.90

The foregoing prices are for base numbers, 6 to 9.

**Bale Ties.**—While this is not the season when much activity is expected in Bale Ties, the market remains firm. The following discounts fairly represent prices in less than carload lots:

Single Loop .....	80 and 2½%
Monitor, Cross Head, &c.....	60 and 10 to 65%

**Copper Products.**—There have been additional advances recently in Copper Materials. On January 3, Copper Wire Rods moved up 1 cent per pound, base, and Copper Wire 1 cent per pound, base, to 26¼ cents, minimum, at mill, in large quantities. On January 4 Soldering Coppers advanced 1 cent per pound, base, to 29 cents on lots of 300 lb. and over, with the usual ½-cent base increase on lots of 100 to 300 lb., and 2 cents advance on lots of 100 lb. and less. Copper drawn bars are now 28½ to 29 cents per pound, flat, according to quantity. There is an increasing demand from consumers already in excess even of past large purchases, which is quoted as indicating legitimate buying for urgent use rather than anticipating orders of a speculative character. At even market rates, it is constantly a question of being able to fill requisitions.

**Glaziers' Points.**—The recent upward movements in the Zinc market have been reflected in an advance of ¼ cent a pound made by some manufacturers of Zinc Glaziers' Points.

**Planer Chucks.**—Manufacturers of Planer Chucks have announced new discounts representing an advance of about 15 per cent. The discount now named for the retail trade is 20 per cent.

**Bull Rings.**—The latest advances in Copper have been reflected by a change in the price of Copper Bull Rings which have moved up about 10 per cent.

**Pruning Shears.**—An advance in the price of Pruning Shears approximating 10 per cent. has been made by several leading manufacturers.

**Thimbles.**—Some manufacturers of Stove Pipe Thimbles have advanced their prices, making the discount to the trade 66 2-3 per cent., on which there are the usual concessions for quantity.

**Taps and Dies.**—The upward tendency of tools in general makes conspicuous such lines as have remained unchanged during the very considerable period in which advances have been taking place. Taps and Dies may be instanced as an example of the latter class, having remained on a practically even level for several years, at least so far as the larger manufacturers are concerned. Recent advances in raw material have raised the question whether or not some corresponding change might be looked for in this line, although it is recognized that the policy of the manufacturers has been to maintain an even level of prices without regard to the movements of the metal market. Among outside manufacturers competition is keen, but quotations have recently shown a somewhat firmer tendency. An exceptional demand is

also reported by all makers of Taps and Dies, and it is suggested that this, together with the higher cost of production, will sooner or later be reflected in these lines.

**Wire Cloth and Poultry Netting.**—It is understood that a meeting of manufacturers of Wire Cloth and Poultry Netting is scheduled to be held in Chicago during the present week. As is well known in the trade several companies are prominent producers of both these lines. The condition of the Wire Cloth market was described in a general way in our last issue, and the situation on Poultry Netting is understood to be about the same. It is generally assumed that advances on both these commodities will be decided on at the coming meeting, although the impression prevails that present prices, which are in effect nominal because of manufacturers' unwillingness to accept further orders, will remain in force until February 1.

**Stanley Rule & Level Company.**—A new schedule of prices, covering a greater part of their product, has been issued by the Stanley Rule & Level Company, New Britain, Conn. Advances are shown in numerous styles of Rules, Squares, Levels and Planes, but the feature of the schedule is that it consists of net prices, and the system of discounts has been virtually done away with by the company.

**Horseshoes.**—On Monday of this week an advance in Horseshoes was announced by several important manufacturers. The possibility of such action was referred to in these columns a week ago. Horseshoes have remained unchanged in price for some years, and the present movement is referred to as a tardy reflection of the higher cost of raw material. The old system of rebate has been abandoned, being declared to have afforded little or no benefit to the jobbing trade in whose interest it was established. It was also recognized as a misnomer, inasmuch as the manufacturers have never made it contingent on the maintenance of a resale price and have made no effort to fix such a price. They have therefore gone back to the regular system of selling, scaling their quotations according to the quantity purchased. New prices announced are \$3.65 per keg for Steel and \$3.90 for Iron Horseshoes to quantity buyers, with a concession of 10 cents per keg on carload lots. To other buyers the price is \$3.85 for Steel and \$4.10 for Iron Shoes. These changes represent an actual advance of 10 cents per keg on carloads and 20 cents on less than carload lots.

**Fifth Wheels.**—Heavy demand and higher prices for raw material have led to recent advances in Fifth Wheels, which are now from 15 to 20 per cent. higher than they ruled last year. Manufacturers report that they are running at full capacity and are offered all the business they can handle.

**Shovels.**—Following the withdrawal of quotations on Shovels by the constituent companies of the Ames Shovel & Tool Company, announced in our last issue, higher prices have been announced by these and several other prominent producers of the line. Quotations represent advances of 5 per cent. in first and second grade goods, and 10 per cent., or nearly 50 cents per dozen on Shovels of the third and fourth grade. Some manufacturers, however, state that their prices remain unchanged.

**Registers.**—Prices on Registers have held firmly throughout the fall and early winter, and in accordance with the concerted announcement of several leading manufacturers, an advance of approximately 10 per cent. will go into effect within a few days. Following the advance the base discount on Registers will be 66 2-3 per cent., beyond which there will be concessions for jobbers and other large buyers, partly represented by a continuance of the rebate system, which is said to be working to the entire satisfaction of the manufacturers.

**M. B. Schenck Company.**—Notice of the withdrawal of all quotations is given by M. B. Schenck Company, Meriden, Conn. On request new discount sheets will be mailed to regular customers and others entitled to receive the same before January 15. In the meantime it is said prices will be kept as low as the recent advances in metals will admit.



**William R. Hartigan.**—William R. Hartigan, Collinsville, Conn., announces that owing to the increased cost of lumber and metal used in manufacturing his Tool Handles, Seat Spindles and specialties, it has been found necessary to raise prices on his goods an average of about 20 per cent. and even more on some lines.

**Cronk & Carrier Mfg. Company.**—A general advance of about 10 per cent. on most varieties of Pliers and Malleable Garden Rakes has been made by Cronk & Carrier Mfg. Company, Elmira, N. Y., which states that nearly every item of material which it uses is from 10 to 40 per cent. higher than a year ago, and as a result the margin of profit on output has been considerably reduced.

**Gifford-Wood Company.**—Gifford-Wood Company, Arlington, Mass., manufacturer of Ice Tools and Ice Cutting Machinery, has advanced its prices about 10 per cent. above the figure ruling last year.

**The F. E. Kohler & Co.**—Owing to the heavy advances in Brass, which have occurred within the last few months, the F. E. Kohler & Co., Canton, Ohio, who manufacture a large and varied line of Hardware Specialties, announce that they have been obliged to make proportionate advances on such articles as this metal enters into. Price schedules, however, remain unchanged on their general line.

**Delphos Oil Cans.**—John M. Hart Company, Chicago, Ill., sales agent for the Delphos Can Company, Delphos, Ohio, announces prospective advances of from \$1 to \$3 per gross on Delphos Galvanized Oil Cans. It is stated that the advance will become effective not later than January 10.

**Victor Hack Saw Blades.**—Massachusetts Saw Works, Chicopee, Mass., has announced an advance of 10 per cent. on last year's prices for Victor Hack Saw Blades.

**Axles.**—The line of Axles is conspicuous as having failed to follow the advancing tendency of raw material and allied products. It is asserted that Axles are being sold as cheap as at any time during the last five years, which some manufacturers regard as much too low considering the price of stock. The bulk of the business for the coming year was placed in the fall as usual and in many cases contracts were entered at lower figures than a year ago. A few manufacturers have made a movement in the direction of higher prices but find it difficult to get advances when their competitors are filling orders at the old quotations.

**Scales.**—Several manufacturers of Scales have withdrawn prices and are issuing new and advanced schedules for 1907.

**Fire Shovels, Pokers, Tongs, Etc.**—Prices on Fire Shovels, Pokers and Tongs were advanced some time since by manufacturers making the general line of Galvanized Ware. Several outside manufacturers have now followed suit and are quoting higher prices on these lines.

**Oneida Community.**—Quotations on American Halter Chains, Dog Chains, &c., have been withdrawn by Oneida Community, Oneida, N. Y.

**Linseed Oil.**—Business is quiet, as buyers are showing little interest in the market. Crushers are not inclined to consider lower prices on the basis of present price of seed and a somewhat depressed market for cake. The market, however, is not strong at regular quotations for delivery during the present month some concession in price might possibly be obtained. New York quotations for jobbing lots are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 41 to 42 cents per gallon. Boiled Oil is 1 cent per gallon over Raw.

**Spirits Turpentine.**—The local market is stronger on more favorable reports from Savannah, where somewhat higher prices ruled. Demand at this point has not been heavy. New York quotations are as follows, according to quantity: Oil Barrels, 71 to 71½ cents; Machine Made Barrels, 71½ to 72 cents per gallon.

**Rope.**—Manufacturers report a fair demand for the season, and a firm market. Quotations are as follows: Pure Manila, 12½ to 13 cents; B quality, 11½ to 12 cents;

Pure Sisal, 9¼ cents; No. 2 quality, 7¼ cents to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents per pound.

**Binder Twine.**—Some activity is noted in the Binder Twine market, sellers soliciting memorandum or price less orders, while some are reported as being willing to sell at last year's price with a guarantee. It is understood that a Western jobbing house has quoted Sisal and Standard at 9½ cents. An Eastern concern has quoted 9¼ cents in carload lots and ¼-cent higher for less than carload lots, f.o.b. New York, for Sisal and Standard, but has received no orders, as yet. The International Harvester Company has not yet announced its prices.

**Window Glass.**—Reports are to the effect that the National Brokerage Company has booked orders for a considerable quantity of Window Glass since the first of the month, and that inquiries are being received in good numbers. Continued activity would possibly mean another advance in prices. The National Brokerage Company is quoting 90 per cent. discount for single and 90 and 5 per cent. discount for double strength Glass, from manufacturer's list. Jobbers' quotations, from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount for all sizes, single and double strength; outside of Greater New York, 90 and 5 for single and 90 and 10 per cent. discount for double strength Glass.

## NATIONAL CONVENTION FOR EXTENSION OF FOREIGN COMMERCE OF THE UNITED STATES.

**A** MOVEMENT designed to devise measures for greatly increasing the foreign consumption of American products, factory, mine and farm, will take definite form in a national convention to be held at Washington, D. C., beginning Monday, 14th inst. The gathering will consist of regularly accredited delegates from the different States and local commercial associations. The various organizations have been asked to send at least five delegates each, and every State Governor has been requested to appoint 10 delegates, 36 of the Governors having already done so. The idea of the convention originated with the New York Board of Trade and Transportation, 203 Broadway, New York, of which Frank S. Gardner is secretary, and the numerous details incidental to such a gathering have been carried out under the auspices of this influential organization. Hardware manufacturing interests will be efficiently represented by the following committee which has been chosen by the American Hardware Manufacturers' Association: C. W. Asbury, Enterprise Mfg. Company, chairman; W. M. Taussig, Challenge Cutlery Corporation; F. E. Muzzy, J. Stevens Arms & Tool Company; Wm. M. Pratt, Goodell-Pratt Company; F. S. Kretsinger, American Fork & Hoe Company; F. I. Johnson, Iver Johnson's Arms & Cycle Company; W. C. Reitz, Pittsburgh Steel Company, and C. A. Horton, American Axe & Tool Company. The proceedings will close with a banquet on Wednesday night, at which President Roosevelt will be present.

**THE WIRE GOODS COMPANY**, Worcester, Mass., is now in a position to supply the Lustral Wire Goods made by the Woods-Sherwood Company, Lowell, Mass. The line of Broilers, Pan Grates, Strainers, Fry Baskets and specialties in kitchen ware make a desirable addition to the Wire Goods Company's own line, and provides a larger variety of high grade goods. Orders can be shipped direct from the Lowell factory or included with shipments from Worcester.

**THE COLUMBUS CHAIN COMPANY**, Columbus, Ohio, states that the reports in regard to the fire in its plant have been greatly exaggerated. There was little interruption in operations, and the plant was again in commission on Monday of this week.

## PRICE-LISTS, CIRCULARS, &amp;c.

*Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.*

OHIO LANTERN COMPANY, Tiffin, Ohio: Illustrated catalogue of Barron Lanterns and Lamps, Wire Cushioned Oil Cans and Demijohns, Burners, Globes, Tin Caps and Tops, &c.

CHAMPION TOOL COMPANY, Meadville, Pa.: Illustrated catalogue and price-list of Horseshoers' and Blacksmiths' Tools.

LAMBERTVILLE SPOKE MFG. COMPANY, Lambertville, N. J.: Illustrated price-list No. 6, of Wheels and Wheel Stock, Spokes, Hubs, Rims, Neck Yokes, Whiffletrees, &c., with directions for ordering, table of proportions, extra charges on Wheels, &c.

CHAS. W. BRENNEMAN & Co., Cincinnati, Ohio: Booklet referring to Brenlin, a new material for making Window Shades, with sample book.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis.: Illustrated booklet listing an extensive line of Milk Cans.

TURNER BRASS WORKS, Chicago: Catalogue No. 28, referring to Automobile, Motor Cycle and Power Boat Specialties.

WAGNER MFG. COMPANY, Sidney, Ohio: Illustrated catalogue covering an extensive line of Cast Aluminum and Iron Cooking Utensils, &c.

MICHIGAN BOLT & NUT WORKS, Detroit, Mich.: Catalogue No. 12, for 1907, referring to Bolts, Nuts, Rivets, Hooks, Turnbuckles, Hangers, Construction Material, &c.

S. G. MONCE, Unionville, Conn.: Illustrated booklet and price-list of Glass Cutters.

TRETHAWAY BROS., Parsons, Pa.: Supplemental catalogue relating to Miners' Lamps and other supplies.

NORTH BROS. MFG. COMPANY, Philadelphia, Pa.: 1907 catalogue of Ice Cream Freezers, Ice Chippers and Ice Breakers.

BUTLER BROTHERS, Chicago: Midwinter issue of "Our Drummer," a complete illustrated catalogue of the extensive lines carried in stock, with prices to the trade exclusively.

HOME METALLIC REFRIGERATOR COMPANY, Albert Lea, Minn.: Illustrated catalogue of De Vaux Refrigerators.

COLD STORAGE REFRIGERATOR COMPANY, Eau Claire, Wis.: Illustrated catalogue for 1907 of Cold Storage Refrigerators.

WHITE ENAMEL REFRIGERATOR COMPANY, St. Paul, Minn.: Illustrated catalogue of Bohn Air Syphon White Enamel Lined Refrigerators.

WISCONSIN REFRIGERATOR COMPANY, Eau Claire, Wis.: Illustrated catalogue of Wisconsin Peerless Refrigerators.

WILSON & FRIEND COMPANY, Chicago, R. T. Goode, agent: Illustrated price-list of Metal Tanks, including Oil and Gasoline Tanks, Self-Measuring Tanks, Transfer Pumps, &c.

MASSACHUSETTS SAW WORKS, Chicopee, Mass.: Attractive illustrated folder and price-list of Victor Hack Saw Blades.

ARCADE MFG. COMPANY, Freeport, Ill.: Illustrated catalogue relating to Family Coffee Mills, Light Hardware Specialties, Household Novelties, Wood and Iron Toys, &c.

FETZER & Co., Middletown, Ohio: Illustrated catalogue referring to America's Pride Grain Drills, &c.

SUN MFG. COMPANY, Columbus, Ohio: Catalogue No. 30 referring to Coffee Mills, Money Drawers, Camp Furniture, Showcases, &c.

ST. LOUIS SCREW COMPANY, St. Louis, Mo.: Illustrated catalogue, with standard price-lists of Milled Machine Screws, Set and Cap Screws, Machine Bolts, Stove Bolts, Nuts, &c., with useful tables of weights.

BEALL BROS., Alton, Ill.: Illustrated catalogue and price-list of Heavy Hammers, Railroad Picks, Track Tools, &c. Occupying a prominent place in the catalogue

are views of their three factories, No. 1 being devoted to Miners' Tools and Supplies, No. 2 to Shovels, Spades and Scoops and No. 3 to the line represented in this catalogue.

MASSEY VISE COMPANY, Chicago: Illustrated catalogue and price-list of Vises.

## TRADE ITEMS.

THE business formerly conducted under the title of L. T. Snow, New Haven, Conn., has been purchased by the Snow & Petrelli Mfg. Company, a new corporation, which will continue to make the line of goods formerly made by Mr. Snow, to which have been added some new specialties. The present address of the new company is 698 Chapel street, but it will remove to the factory at the corner of Hamilton and Chapel streets after May 1, and with increased and improved facilities will be able to execute all orders with exactness and promptness.

THE ZELNICKER CRAYON WORKS, St. Louis, calls attention to its line of Soapstone Crayons for marking metals either hot or cold, in a neat booklet, the pages of which contain reproductions of the work that can be done. They are made in all colors, as well as white and purple indelible.

THE LIVINGSTON NAIL COMPANY, which for many years has occupied the street floor and two lower floors at 104 Reade street, New York, has just taken a suite of offices in the Vincent Building, 302 Broadway. The great advance in methods of communication in various ways, both in the transmission of orders and transportation of freight from the various factories represented by the company, has convinced the management of the uselessness of attempting to carry a stock in New York. The company can in most instances assure deliveries of goods direct from factory on day following receipt of order.

WARREN COUNTY, Miss., recently contracted with a Western manufacturer to supply four steel cages for the county jail. It was agreed that the cages furnished should be proof against tool cutting. With a view to satisfying themselves as to the strength and endurance of the bars forming the cages the Warren County authorities had one of the bars, submitted for this purpose, put to a test. The wrought steel bar was something over an inch in size, and much to the astonishment of the authorities a local iron and steel worker saved through the bar in 4 hr. The tool with which the job was done was a 12-in. No. 250 Flexible Back Hack Saw, made by L. S. Starrett Company, Athol, Mass. This Saw is also manufactured in 6, 7, 8, 9, 10 and 11 in. sizes.

ON February 1 the Oregon Moline Plow Company will succeed to the business of the Moline-Bain Company, and will conduct distributing warehouses at Portland, Ore., and Spokane, Wash., with J. S. Patton as resident manager, and J. G. Stratford, Jr., assistant manager. This firm will carry a full line of goods manufactured by the Moline Plow Company, Moline, Ill.; Mandt Wagon Company, Henney Buggy Company, as well as Plano Cutting Machinery, Monitor Drills and Seeders, Good Sense Sleds, Jenkins' Hay Tools, &c.

THE annual banquet of the New England Iron and Hardware Association will be held at Hotel Vendome, Boston, Tuesday, January 15. President Roswell M. Boutwell and the committee in charge are putting forth every effort to make the dinner one of the best of the long series in which this organization has participated.

ROBINSON BROS. & Co., Hardware jobbers, Louisville, Ky., entertained their employees at a banquet at the Tavern Club on Friday evening, December 28. Covers were laid for 40, and the decorations and menu were in excellent taste. Harry E. Pfingst, secretary of the company, presided, and toasts were responded to by C. P. Robinson, Jos. Wanless, R. A. Robinson, C. P. Dawson, W. O. Farnam, Rudolph Zimmerman, G. N. Rock, Edward Morton, E. E. Ashcraft, W. T. Plummer and C. T. Cook of Nashville, Tenn. On behalf of the traveling salesmen employed by the firm, the sales manager, Harry E. Pfingst, was presented with a handsome watch chain.



## TRADE WINNING METHODS.

*This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effect to make it suggestive and of practical use to the trade.*

### NEW YEAR'S GREETING.

**J.** J. SNYDER & SON, Brooklyn, N. Y., addressed to their friends and customers a pleasant circular letter of New Year's greeting. The circular is embellished with an excellent likeness of John J. Snyder, Sr., well known in the metropolitan district as "Snyder of Flatbush," while the letter is couched in the happy phrases characteristic of the firm's advertising matter, and runs as follows:

With the dawn of another year we take this opportunity of wishing for you a generous share of all the good things held in store by "Father Time" for distribution during the coming 12 months.

We also desire to express our sincere thanks for your patronage, which, during the year just closed, has aided us to break all records in regard to the volume of business transacted.

Our best efforts will be put forth in the future to merit a continuance of your confidence.

Nor can we allow the occasion to pass without alluding to a unique feature in our business history:— We refer to the friends (long since considered more than patrons) who, either personally or as successors to their parents or grandparents, have so loyally stood by us for an unbroken period of 25 and in many instances 35 years.

To these friends, whom we take pleasure in mentioning in the list that follows, we acknowledge our obligation.

Appended is the list referred to, which is an extensive one and includes many well-known names identified with the growth and development of Brooklyn. This is an idea which will doubtless be interesting and suggestive to other Hardware merchants. It may readily be believed that the publication of such a list of regular customers, embracing the names of citizens standing high in the community, would add to the prestige of the firm and carry a hint of flattery not unacceptable to those whose names were used.

### ADVERTISING CARDS OF AN ALABAMA HOUSE.

**W**ITH a view to making the public familiar with the fact that its stock comprises certain articles which perhaps are a little aside from the usual Hardware line the Morton Hardware Company, Bessemer, Ala., issues cards of a similar character to those reproduced herewith. The cards are about 2½ x 4 in. in dimensions and white in color. A supply of the cards is



carried by all the company's employees, and when opportunity presents they are handed to those for whom they may possess interest. The cards are also distributed by a man especially chosen for the purpose, who visits the wagon yards and talks to the farmers. Besides the cards shown there are others relating to Cant Hooks, Log and Tie Chains, Toys and Fireworks, Washing Machines and Wash Pots, Lubricating, Signal and Linseed Oils, Rope, Tackle Blocks and Screw Jacks, Bridles, Saddles and Harness, &c. The company refers to this as an effective means of keeping its name before the public in connection with the goods thus featured.

In the way of newspaper advertising the company advertises regularly in a Birmingham daily, which has a very large circulation in Bessemer. The announcement



always appears directly under the Bessemer news heading, this privilege having been contracted for with the publishers. A 1 to 2 in. double column space is used every day but Saturday, when a larger space is occupied. The subject matter is changed every day, and as the same position has been used for the past three years it has come to be regarded as a part of the head line, and when at rare intervals the advertisement has failed to appear through delay in furnishing copy the fact has been commented on by some of the readers of the paper. Some advertising is also done in the local weeklies, but as they are overshadowed by the Birmingham dailies the company does not consider them valuable mediums.

"**HARDWARE NEWS**" is the title of the store paper issued by Thielman Bros., Hardware merchants of St. Cloud, Minn. It is pink in color, with printing in black. The current issue is copiously illustrated and is devoted to selections from such lines as Tools, Cutlery, Sporting Goods, Ranges, Kitchen Articles, &c.

**E. P. RICHFORD** of Richford & Co., 153 Fleet street, E. C., and 52a High Holborn, W. C., London, England, is now on his first visit to the United States, in connection with the business of his house. He is especially interested in meeting manufacturers and getting trade literature of small mechanical novelties and automatic hand tools, such as Electrical Devices, Safety Razors and Accessories, Automatic Hand Checking and Counting Mechanism, Pedometers, Patented Paper Fastening Articles, and kindred novelties suitable for export. The business, established in 1876, specializes in Cutlery and the latest novelties. Mr. Richford is also connected with **E. M. Richford**, 8 and 9 Snow Hill, London, E. C., manufacturer of rubber stamps and type. Mr. Richford expects to be in this country until about February 1, and may be addressed at the Broadway Central Hotel, New York City.

**JAMES PENDER & Co., LIMITED**, St. John, N. B., manufacturers of Wire, Wire Nails, Horseshoe Nails, Toe Calks, &c., have worked out successfully an invention for use in connection with their galvanizing department. The device, which is the idea of **J. Fred Pender**, son of the manager of the firm, is used for shaking the baskets in which Nails are galvanized, after they have passed through the zinc. It can also be used for any other class of galvanizing in which baskets are employed. The invention is believed to be a valuable one, and application for a patent has already been made.

THE annual meeting of the Syracuse Chilled Plow Company was held January 8 and the following officers were elected for the ensuing year: **C. A. Chase**, president; **W. W. Wiard**, vice-president; **A. K. Hiscock**, vice-president; **Francis Hall**, secretary; **James Manning**, treasurer; **H. Wiard**, superintendent. Trustees: **C. A. Chase**, **W. W. Wiard**, **A. K. Hiscock**, **Francis Hall**, **James Manning**, **H. Wiard**, **T. J. Leach**, **A. C. Chase**, **Emma P. Willets**.

THE **WALWORTH MFG. COMPANY**, Boston, Mass., has been appointed sole agent for the sale of the Genuine Robbins Chain Tong. The company will be pleased to quote prices and terms on application.

## The Post Office Appropriation Bill.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., January 8, 1907.

THE series of hearings on the annual post office appropriation bill before the House Committee on Post Offices and Post Roads began to-day. They will probably continue for two weeks. The committee will then proceed to draft the bill, which will in all likelihood be reported to the House about February 1.

### Parcels Post "Experiment."

While the promoters of so-called postal "reforms" never permit the Post Office Committee to lose sight of the perpetual campaign in the interest of a domestic parcels post, yet so far as the present session is concerned no serious attempt is being made to pass either the Hearst or Henry bill. The parcels post advocates, however, are pushing a project involving the incorporation in the annual appropriation bill of a small allotment of a few thousand dollars for an experimental parcels post, to be established between several important cities of the East and West, the avowed object being to determine whether the numerous current estimates of the cost of maintaining a domestic parcels post are at all accurate. This plan is similar to the scheme embodied in the so-called Denny bill, which was strongly urged in the Fifty-eighth Congress, but which the postal committees declined to touch, having in mind the now famous "experiment" which began with a \$10,000 appropriation to test the rural free delivery plan and which now involves an annual outlay of nearly \$30,000,000.

### Consolidation Schemes.

In the event that the House committee will not consider even an experimental parcels post, it will be asked to adopt one of the alternative consolidation schemes recommended by Third Assistant Postmaster General Madden in his recently published annual report. Mr. Madden suggests, first, that the third and fourth classes of mail matter be consolidated at the rate of 8 cents per pound; or, second, that the rate on fourth-class matter (merchandise), be fixed at 1 cent for each 2 oz. not in excess of 1 lb. and 1 cent for each additional ounce; or, third, that the rate on merchandise be fixed at 1 cent for each ounce not exceeding 6 oz. and 1 cent for each 2 oz. in excess of 6 oz. Just how it can be argued that the adoption of any one of these alternative suggestions would "simplify" the administration of the postal service it is rather difficult to see, but the practical feature of the recommendations is the reduction in the rate of postage on merchandise which would be brought about by the adoption of any of these schemes. As Chairman Overstreet stated to the correspondent of *The Iron Age* when the original consolidation project was under discussion in the House committee, the chief result from the adoption of General Madden's suggestion would be to reduce the postage bills of the catalogue houses at the expense of the Treasury, and, therefore, of the taxpayers at large.

It is the consolidation project that the postal reformers are now urging with the greatest energy and that the Postal Progress League in particular is bending its energies to force through Congress. In a statement given out a few days ago by James L. Cowles, the secretary-treasurer of the league, it is frankly announced that the adoption of the consolidation project will be regarded as equivalent to the establishment of a limited parcels post, the extension of which, he says, would "solve the railroad rate problem." He adds that "an effort will be made to get a Congressional appropriation of \$50,000 to experiment with a parcels post on some of the rural free delivery routes." Mr. Cowles is probably not responsible for the additional statement attributed to him that he "would have the Government transport the farmer's grain and family, as well as his mail."

### Reduced Rate on Rural Route Packages.

The so-called Bristow plan for the establishment of a reduced rate on packages carried on rural routes, pro-

vided they originate on the same route upon which they are delivered, is also being advocated by the reformers, but the real work in favor of this plan is being quietly done by representatives of the mail order houses, who see an opportunity to cut down the cost of delivering their catalogues. These catalogues are said to cost about 40 cents, while the postage on each is 26 cents. They will be sent to any one on receipt of 15 cents, so that the mailing of each copy involves a loss of 50 cents. One house is credited with sending out 2,000,000 copies, thus making an annual net loss of \$1,000,000. The Bristow plan would permit these catalogues to be sent by freight to distributing offices in rural free delivery districts and 9 cents postage would carry them to their ultimate destination. Allowing 1 cent per copy for freight and cost of transfer to the mails, this would mean a saving of 16 cents per copy, or \$320,000 on the annual edition of a single catalogue house. The figures quoted are not estimates, but are taken from a widely published article in a New York magazine, the material for which was painstakingly gathered in Chicago, and largely furnished by the catalogue house referred to.

### The Post Check

One of the most dangerous, because apparently harmless, projects of the postal reformers that will be strongly urged upon the committee during the next fortnight is the post check, or postal currency plan, which even the Post Office Department has been induced to favor. The tendency of all catalogue house legislation is along two lines: First, to get the farmer's money most easily and conveniently, and second, to deliver goods through the mails at the lowest possible cost for postage. The very reasonable safeguards thrown around the postal money order system operate to some extent to protect the local retailer by aiding him in holding his trade. The postal currency would simply facilitate the sending of money away from home and, while theoretically unobjectionable, in practice it could not fail to work great injury to local merchants everywhere. The manner in which sentiment in favor of the so-called post check currency system has been worked up for several years past by a paid lobby of ex-post office officials stationed in Washington was fully exposed in *The Iron Age* last April. All the cost of advocating this particular project has been paid by a millionaire manufacturer of breakfast foods, who has "worked" the press of the entire country in a very ingenious, if not altogether legitimate, manner.

### The Psychological Moment.

Summarizing all these schemes for depleting the federal Treasury in the interest of a few big mail order concerns, it should be said that the memories of Congressmen are not very long and that the impressions gained during one session are frequently lost before the beginning of another. The Hardware trade, therefore, should seize the present opportunity to bring its views to the attention of the House Post Office Committee at what will prove the psychological moment. Congress should hear from the trade in no uncertain tones within the next fortnight. A little energetic work may save millions of local trade that would speedily be lost if any of these schemes should go through.

W. L. C.

## THE CONSOLIDATED HANDLE COMPANY.

THE CONSOLIDATED HANDLE COMPANY, with plants at Manor, Pa., Memphis, Tenn., Huntsville, Ala., and Harrisburg, Ark., has been chartered under the laws of Delaware with a capital stock of \$1,000,000. The combined plants will have a capacity of about 2000 dozen Hickory Handles per day. The officers of the new corporation are M. R. Grace, Memphis, Tenn., president; W. J. Beamer, Manor, Pa., secretary, and Hon. E. E. Robbins, Greensburg, Pa., treasurer.

Neidig, Drake & Kolb, Goshen, Ind., have been succeeded by C. E. Neidig, who has had charge of the business for the past six years. He will continue to handle Hardware, Paints, Lumber, &c.



## DEATH OF ANDREW CORBIN.

**A**NDREW CORBIN died in New Britain, Conn., Friday, January 4, in his seventy-fourth year, after an illness of three years. Within the past few months his health failed materially, and his superb constitution yielded at last after an exceedingly active, honorable and useful life.

Andrew Corbin was a brother of Philip Corbin, who is about nine years his senior, Philip being the founder and existing head of P. & F. Corbin, and the other numerous and important Corbin manufacturing enterprises. Andrew was born June 16, 1833, in West Hartford, Conn., and was the son of Philip Corbin. The Corbin family traces its ancestry back to Robert Corbin of Normandy. An ancestor, Geoffrey Corbin, and another, Walter Corbin, are mentioned in English history. John Corbin, also an ancestor, rendered valuable service in the Indian wars of King Philip in 1675.

Andrew, the subject of this sketch, was one of a family of 10 children, the seven brothers being Hezekiah, Waldo, Philip, Frank, George S., William and E. Albert. In 1854 he was engaged in the manufacture of jewelry, first for employers and later on his own account, occupying quarters in the Corbin factory for several years. He first became identified with the house of P. & F. Corbin in 1858. In 1860, Frank Corbin, one of the founders, severed his connection with the company to enter the plumbers' supply business, and Andrew went to New York to conduct the business of the branch there, remaining in New York until 1872, when he returned to New Britain to become general manager, and with his genius for the position he so acceptably filled, he had an important part in establishing and perpetuating a great manufacturing industry.

Mr. Corbin was a man of rare mechanical ability, possessing quick, accurate judgment of the relative value of manufacturing processes and the Corbin faculty of planning upon broad lines for the future. He and his brother Philip, working and planning together, made the immense plant what it is to-day, as homogeneous and convenient as though conceived and erected as a whole instead of being built in sections and at intervals of years.

His return from New York witnessed the development of a more vigorous and animated spirit in the business, he supervising the production, with the late John M. Spring, superintendent, to execute the details. Quiet and unassuming to an extreme, the quickening and masterful impulse of Andrew Corbin's factory management was realized and felt in every department. The official position of first vice-president he held for many years.

Mr. Corbin married Mary Moore, November 8, 1854, his wife living until September, 1905. He is survived by a daughter, Mrs. Charles E. Wetmore, wife of the treasurer of P. & F. Corbin.

It is said of Andrew Corbin that few manufacturers have won and retained for so many years the degree of warmth of esteem with which he was regarded by the operatives serving under him, no matter how humble their capacity. He was held also in the highest regard and affection by his associates who unite in bearing testimony to his worth, his attractive personality, his re-

markable ability and his share in building up the great enterprises with which he was so prominently identified.

This outline of the career of one of New England's great manufacturers cannot better conclude than with the following touching tribute from one active in the carrying on of the business, in the founding and development of which Andrew Corbin had so influential and honorable a part:

Andrew Corbin possessed one of the most charming personalities that ever was given to a strong man. He was quick and accurate in his judgment, a man of very few words.

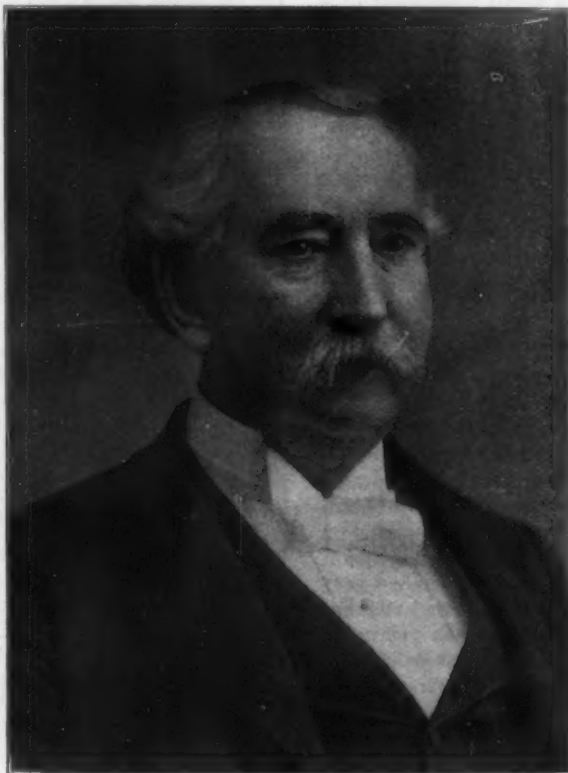
Andrew Corbin possessed that rare ability which we call good sense, and coupled with his mechanical turn of mind, he was a genius in adapting processes and means to economical production. One of the largest manufacturing plants in New England will stand as a monument to his genius in adapting mechanical means to a profitable end.

Personally, Andrew Corbin was of a kind and loving disposition. He had that rare magnetism possessed by so few that one had only to see him in order to respect him.

To know him was to love him, and with increasing timidity one came to know him and to love him as an ideal man.

Censure at his hands was sharp, short and decisive, but never left a sting, for his conduct and language were always clothed with that rare wit and great love for mankind which he always possessed—it can be truly said that censure at his hands was better than praise from the hands of other men.

He has gone from our midst, but his memory will be very dear to us, and one of the greatest industries of New England will stand as a monument to his genius.



ANDREW CORBIN.

## CALENDARS, Etc.

SICKELS, PRESTON & NUTTING COMPANY, Davenport, Iowa: In accordance with its custom for some years the company has favored its friends with half a dozen beautiful reproductions of modern paintings, taken from the originals by color photography.

MASSACHUSETTS SAW WORKS, Chicopee, Mass.: Circular letter of New Year's greetings with box attached containing pocket pencil holder and pencil points.

THE ALLIANCE MACHINE COMPANY, Alliance, Ohio: Large hanger calendar with monthly sheets.

THE BERGER MFG. COMPANY, Canton, Ohio: Unique hanger card conveying the company's abundant good wishes to its customers.

F. E. MYERS & BRO., Ashland, Ohio: Large poster and calendar with many illustrations of Pumps and Hay Tools.

THE JENNISON HARDWARE COMPANY, Bay City, Mich.: Memorandum book in the interest of its Heavy Hardware and Supply business.

GARLAND NUT & RIVET COMPANY, Pittsburgh, Pa.: Art calendar with monthly sheets.

THE WYOMING SHOVEL WORKS, Wyoming, Pa.: Weekly memorandum calendar for 1907.

NICHOLSON FILE COMPANY, Providence, R. I.: Attractive folder extending greetings for the season.

KIRCHER & SON, Belleville, Ill.: Weekly desk calendar for 1907.

JONES HARDWARE COMPANY, Richmond, Ind.: Art calendar, with monthly sheets.

## J. H. Williams & Co.'s Drop Forging Plant.

### Second Article.

*The first article of this series appeared in the issue of January 3.*

**T**HE office library, Fig. 10, indicated in the plan of the office floor, is a room 24 x 32 ft., where all correspondence is filed and indexed by number, each corre-

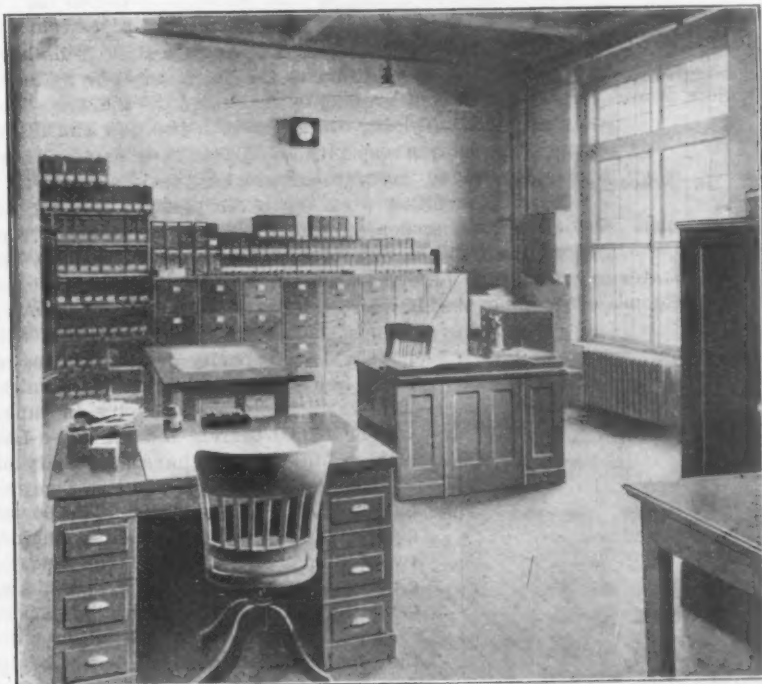


Fig. 10.—A Section of the Office Library.

spondent being designated by a different number. When referring to correspondence the inquirer receives all of it in a folder from the single source, the attendants in charge locating the accumulated letters instantly by referring to the index kept for that purpose. Each com-

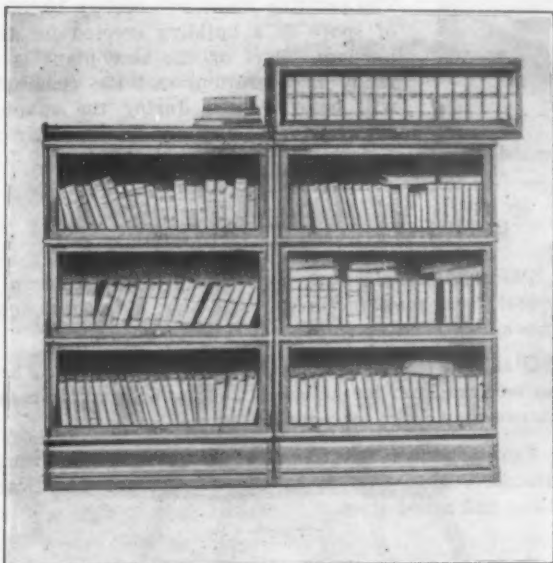


Fig. 11.—Unit Cases Containing Books for Men's Library.

munication is filed in consecutive order according to date. Stationery and office supplies of various kinds are closely related to this department, the articles being distributed on a requisition from the applicant, in which is designated by number whatever is wanted in the way of printed forms and other office accessories. In an adjoining room or annex, kept locked, is stored the main supply

of stationery, &c., which is designated for identification by numbers and letters corresponding with like figures in the office library.

### Library Cases.

The covered books constantly accessible to all employees and already referred to in the allusion to the men's library belong properly in the reading room on the third floor with other literature provided for perusal there, but as the books can be taken away under library regulations the sectional cases, Fig. 11, are kept in one of the storerooms on the street floor for greater convenience and in charge of a competent man.

### Stock Clerk's Office.

Fig. 12 reproduces a portion of the stock clerk's office, the chief of which, with six assistants, give their entire attention to the care of stock, the head stock clerk, with one assistant, having their headquarters in this office, the others being variously located in close contact with the goods they are particularly assigned to. The room is light, commodious and well equipped for expeditiously handling this part of the business. Brass pneumatic tubes lead into this room from the main office, as previously mentioned; there is a local and long distance telephone station, a drawer cabinet for keeping stock inventory cards and another similar cabinet for holding samples and other important small parts from customers, &c. In this room is kept a board arranged for the purpose on which hang the various standardized Nuts of United States and Whitworth specifications, by which to gauge all of the numerous kinds of Engineers' Wrenches manufactured by the company.

### Storerooms.

At the northerly end of the first floor is the general storeroom for shop supplies, containing such articles as Nails, Oil, Wrapping Paper, Glass, Waste, Soda, Glue, Plaster of Paris, Belt Dressing, Alcohol, &c., even to Rubber Boots for the men in connection with certain duties. There is also another storeroom on the street floor for many supplies, such as Nuts and Bolts, Screws, Emery Wheels, Emery Cloth, Oil Cans, Polishes, Twine, Lamps and Lanterns, Brushes, Cotter Pins, and the innumerable articles that are continually creeping into the lists of modern supply departments.

(To be continued.)

### MANUFACTURERS AT RICHMOND.

**A**S announced in our last issue, the seventeenth annual convention of the Southern Hardware Jobbers' Association will be held at Richmond, Va., June 11-14. As usual the American Hardware Manufacturers' Association will hold its semiannual meeting at the same time. The headquarters of both associations will be at the Jefferson, which is being remodeled, the new additions, which will be ready for occupancy next month, including 300 sleeping rooms and the principal public rooms of the hotel. The hotel will thus be admirably adapted to the large requirements demanded by these conventions. All applications for reservation or rooms at the Jefferson should be addressed to P. M. Fry, manager.

An effort will be made to complete the work of the manufacturers' convention and perhaps the jobbers' by the evening of June 13, so as to permit the members and other visitors to spend the 14th at the Jamestown Exposition.

F. L. CHARLES, who has made many friends in the trade as the representative of Auburn Hame Company, Auburn, N. Y., has become associated with Bellefontaine Hame Company, Bellefontaine, Ohio.



## PACIFIC FEDERATION OF HARDWARE AND IMPLEMENT ASSOCIATIONS PROPOSED.

**A**N effort is to be made to fuse the various associations of Hardware and Implement merchants in Pacific Coast territory, and for this purpose a meeting has been called at Portland, Ore., on February 11. The exact place of meeting in Portland has not yet been selected, but will be announced later. The call for the meeting has been issued under the auspices of the Inland Empire Implement and Hardware Dealers' Association, E. W. Even-son, secretary, Spokane, Wash., who will be pleased to respond to any inquiries concerning the gathering. Co-operating with the Inland Empire organization in the movement are the following associations:

Idaho Retail Hardware and Implement Dealers' Association.

Walla Walla and Columbia County (Wash.) Implement and Hardware Association.

Umatillo County (Ore.) Implement and Hardware Association.

Oregon Retail Hardware and Implement Association.

California Retail Hardware Association.

The circular containing the call for the meeting states that the experience of the past few years has demon-

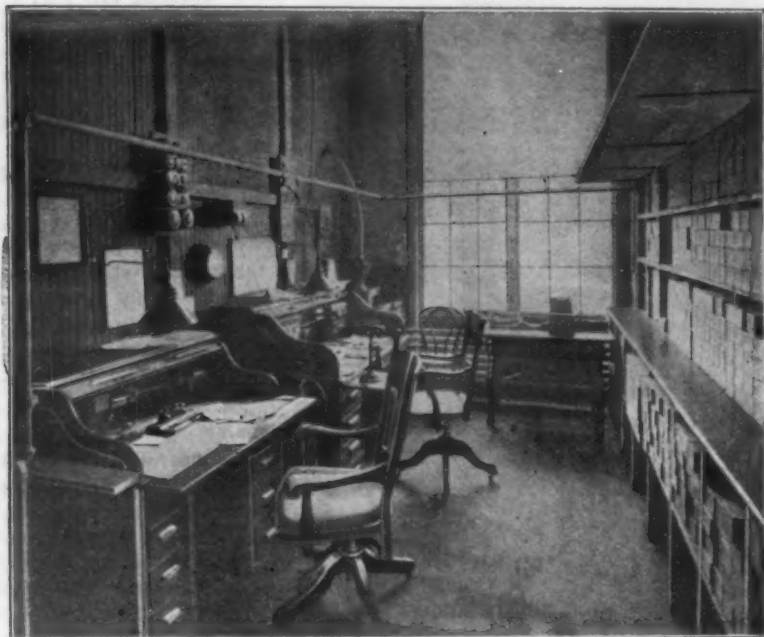


Fig. 12.—Chief Stock Clerk's Office.

strated that there is need for earnest co-operation upon the part of the retail trade throughout the Pacific States in some arrangement whereby large and important questions not local in their nature, but applying with equal and peculiar force to all retail Hardware and Implement merchants in that section of the country, can be handled to advantage. With this end in view the members of the trade in the States of Montana, Washington, Idaho, Oregon, California, Nevada, Colorado and Arizona are cordially invited to attend the meeting at Portland. Special rates on all railroads entering Portland are being arranged for, and it is hoped that the gathering will be a large and representative one.

UPWARD of 150 salesmen attended the fourth annual convention of salesmen and department managers of Hibbard, Spencer, Bartlett & Co., Chicago, held on December 27 and 28. Instructive talks for promoting the sale of the different lines of goods were given by the buyers on the first day of the meeting, and the morning session of the second day was given over entirely to manufacturers' representatives. In the afternoon the heads of the departments gave short talks, and the convention closed with a salesmen's experience meeting. The Committee on Arrangements consisted of Frank Hibbard, chairman; A. M. Graves, secretary; Wm. G. Hibbard, Jr., E. A. Burke, A. P. Reiter, Wm. A. Meyer and Wm. F. Waller.

## GLIDDEN VARNISH COMPANY'S NEW PLANT,

**A** NEW \$600,000 varnish plant is being erected by the Glidden Varnish Company, Cleveland, Ohio. The plant occupies a site covering 16½ acres, on which are being erected 26 buildings. The largest structure, the grinding building, is 50 x 200 ft. and three stories high, being of reinforced concrete and brick construction. Practically no wood is used in any of the buildings. The doors are of iron and the windows of wired glass. The grinding building is equipped with the latest improved twin mixers so arranged that material is mixed on the third floor and is gravitated through drop pipes into the hoppers of the mills. Several up to date stone mills have been installed in addition to the old ones. The material when mixed and ground is gravitated to the first floor by a system of piping connected with two new can filling machines with a capacity of 40,000 cans each. These machines have accurate measuring devices, and they take the can filling work up to the point of packing, all the work being done automatically. The cans go from the grinding building to the Jap-a-Lac warehouse adjoining, and here the cans are assorted and put on cars. In piping the Bowser system of self-measuring power pumps is used. The Glidden plant will have a daily capacity of 100,000 cans of Jap-a-Lac and 500 barrels of varnish. The varnish storage capacity in tanks will be 15,000 barrels and the Jap-a-Lac storage building will have a capacity of 5000 barrels, making a total storage capacity of over 1,000,000 gal. The power equipment consists of one 150-hp. engine, two 150-hp. boilers, one 100-hp. gas engine, each engine connected with a 75-kw. generator. The entire plant will be operated by electricity. In connection with the plant are four melting houses of 10 fires each for gum and high grade varnishes, and 27 fires for oil boiling and black varnish goods. A separate building for the filter and laundry departments is equipped with 15 modern filter presses and 21 modern cloth laundry machines. In addition there will be a complete printing plant, with presses and other equipment for all kinds of work. The printing plant will occupy 10,000 ft. of space in a building erected for that purpose. Part of the new plant is already in operation, and the remainder will be completed during the summer. The Glidden Company has recently increased its capital stock from \$200,000 to \$1,000,000.

## REQUESTS FOR CATALOGUES, &c.

*The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

**REQUESTS** for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM ERNEST S. CLARK, 1204 Greenmount avenue, Baltimore, Md., who is in the market for Hardware, Paints and allied lines.

FROM MOORE-SUMMERS HARDWARE COMPANY, Welch, W. Va., which has been incorporated with an authorized capital of \$25,000, to conduct a wholesale and retail business in General Hardware and Household Goods, Furniture, &c.

FROM W. V. GALLAGHER, Baltimore, Md., who has just removed to his new three-story building, at 1640 and 1642 Pennsylvania avenue. Besides carrying Hardware, Mr. Gallagher will make a specialty of Sporting Goods and also manufacture Screens.

## ANNUAL DINNER OF LOGAN-GREGG HARDWARE COMPANY.

LOGAN-GREGG HARDWARE COMPANY, Pittsburgh, tendered its annual dinner to its employees on December 29. Tables were spread in the spacious sample room of the company's warehouse, which was partially cleared for the purpose. About 100 persons participated in the event, a feature of which was the presentation of a handsome watch and fob by the employees to the president, Geo. B. Logan, who has been associated with the company for more than 40 years. The menu of the dinner was got up in recognition of the diamond jubilee or seventy-fifth anniversary of the company, which was established in 1831.

The custom of holding such a gathering after inventory originated many years ago when it was known as the "stock supper." At that time the members of the firm and the employees used to guess on the amount of the stock and the one making the poorest guess gave the dinner to his associates. As the number of employees increased this obligation was assumed by the firm and has long been a regular event. The year just closed is referred to as the busiest and most prosperous in the company's history, and even greater things are looked forward to in 1907.

## MISCELLANEOUS NOTES.

### Chinaline Refrigerators.

In addition to its other well-known lines of domestic, store and restaurant refrigerators, the 1907 catalogue and price-list of the Gurney Refrigerator Company, Fond du Lac, Wis., describes the Chinaline, which are claimed to possess all the merits of the other refrigerators made by the company, and in addition are lined with plates of opalite 7-16 in. in thickness, with a china-like finish. The rounded corners of the tops of these refrigerators greatly enhance their appearance, and is a new feature of this line. To avoid possible breakage of the opalite a plated wire rack is fitted on the bottom of the provision chamber, although in case of accident the plates can easily be replaced. Small samples of opalite will be furnished the trade on application.

### Adler Pressed Steel Step Ladder.

H. Adler Company, Carnegie, Pa., is offering the patented pressed steel ladder here represented. It is made



Adler Pressed Steel Step Ladder.

with the exception of the steps of 20 gauge open hearth steel sheets, reinforced with heavy drawn steel bead all around, which gives a panel effect and adds to the appearance as well as to the strength and rigidity of the

ladder. The steps are made of No. 1 cotton or bass wood, which the manufacturer decided on after experimenting with metallic steps and which it declares to be superior because they are firmer, less slippery and more durable inasmuch as they will not rust. The steps are put into the stiles with eyelets, so that in the remote possibility of one being broken it could be easily replaced by anybody. The finish of the ladder is maroon enamel, which, it is asserted, is absolutely rustless. Ladders are made with and without metallic bucket shelves and at present include sizes of 4, 5, 6, 7 and 8 ft. Rubber shoes are supplied at moderate cost for use on marble and hardwood floors. It is declared that the Adler ladders do not exceed wooden ladders in weight, the average weight being but slightly more than 3 lb. to the foot.

### Walden Ratchet Tire Bolt Wrenches.

Patterson, Gottfried & Hunter, 146-150 Centre street, New York, are putting on the market a series of mod-

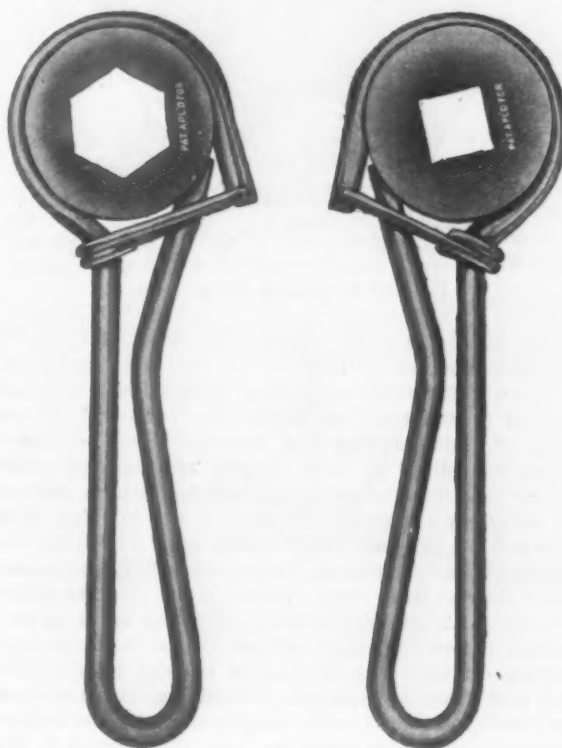


Fig. 1.—Walden Hexagon Tire Bolt Ratchet Wrench.

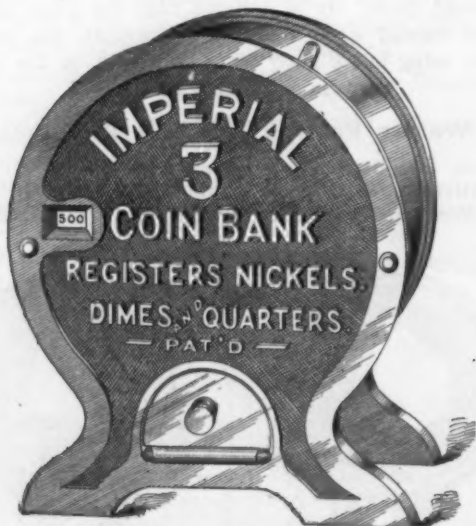
Fig. 2.—Same Wrench for Square Nut Tire Bolts.

erately priced ratchet tire bolt wrenches, the two styles of which are here illustrated about two-thirds size. While a device of this character is handy and useful in many ways, its original purpose is for the quick tightening or removal of hexagon or square nuts of tire bolts on the inner and inconveniently reached nuts of both automobile and carriage or wagon wheels. The wrench is made to fit exactly most of the hexagon nuts of automobile tire lugs, the hexagon openings being  $\frac{1}{2}$ , 9-16,  $\frac{5}{8}$  and  $\frac{3}{4}$  in., Fig. 1 illustrating the hexagon style. The ratchet wrench, Fig. 2, for square nuts will fit the standard nuts of  $\frac{1}{4}$ , 3-16,  $\frac{1}{4}$ , 5-16 and  $\frac{3}{8}$  in. in diameter tire bolts, more particularly for wooden carriage wheels. The circular metal center has teeth in the groove, so that as the handle is moved backward and forward the bent steel wire handle, held in place by the smaller wire loops, engages with the teeth, thus enabling an individual to quickly tighten or remove tire bolt nuts and without rounding or burring the corners. The wrenches are about 5 in. long over all, and the handles are made of 3-16 in. steel wire, the principal advantages of which are the light weight, ease and rapidity with which nuts can be turned without injury and the small cost.



### Imperial Self-Registering 3-Coin Bank.

The Plaget Novelty Company, 265 Broadway, New York, which makes a specialty of patented novelties, especially registering savings banks, has just brought out the Imperial 3-coin bank here illustrated, which will accurately register nickels, dimes and quarters up to \$5, and repeat. The results obtained from this bank are similar in character to those afforded by the older barrel and Saratoga trunk patterns manufactured by the same company, the novelty in this instance being



*Imperial Registering 3-Coin Bank.*

largely in the attractive shape and finish, this production combining in its construction late patents as well as parts of preceding patent principles. Although adapted to receiving and registering 5, 10 and 25 cent pieces of United States coin, the mechanism is capable of being modified to meet foreign requirements under similar conditions, on orders of sufficient size to warrant the necessary changes. The bank is  $4\frac{1}{2}$  in. high, 4 in. wide and  $2\frac{3}{4}$  in. deep, outer dimensions. The front and back is of cast metal and the curved center portion and hinged door of sheet steel. The back and front resembles in color finish statuary bronze, the raised parts of each polished before plating in antique copper, thus making a pleasing contrast with the darker stippled backgrounds. Back and front are strongly riveted together, the sheet steel curved center of body being in a mottled or antique copper, polished. In operation coins are inserted at the center of top forward, the small projecting finger piece being moved backward and forward after each insertion, the movement of which causes the large dial to register always the aggregate total in the bank until \$5 is deposited, when the semicircular bottom door can be pulled forward and the bank emptied, or, the \$5 allowed to remain and the registration repeated up to the bank's capacity in coin, if so desired, but the door can only be opened when the dial records \$5.

### The Diamond Hunting Hatchet.

The Diamond Tool Company, 83 Pearl street, Boston, is putting on the market a hunting hatchet which has a number of important features, most novel and interesting of which is the use of the Jones adjustable handle fastener, which is shown in place in the accompanying illustration. The fastener, for which a patent has been applied, not only keeps the handle always tight in the blade, but also permits the easy removal of the handle for its replacing, all that is necessary being to turn the screw. The fastener consists of a wedge shaped metal part, fitting a recess in the end of the handle. At the bottom of the wedge, enclosed within it, is a nut that takes the screw, which is rather a bolt with screw head. After the blade has been placed upon the handle the bolt is screwed into the nut, pulling upward on it and causing the fastener to expand, rigidly holding it in place, so that

it acts as a very positive wedge. It completely does away with the usual form of wedging, which requires for the removal of the handle either cutting away or burning the wood in the socket, both of which are difficult. The hatchet has a claw for pulling nails. The handle is correct in shape and "hang," and the form prevents it slipping through or from the hand, no unimportant feature in the woods when hands are cold. The hatchet is made of strictly high grade stock, the blade being of blue steel and capable of withstanding the hardest usage. It is furnished with a leather sheath for carrying at the belt. The weights are from  $1\frac{1}{4}$  to 2 lb., and the handles are furnished in lengths of 16, 18, 20 and 22 in. The



*Diamond Hunting Hatchet.*

company also makes a camp axe which has all the features of the Diamond hatchet excepting the claw.

### The Sawyer Surface Gauge.

The surface gauge shown in the illustration has several features in which it differs from accepted types at present on the market. As will be seen, the tool has a heavy base of hardened steel, slotted at one side of its upper surface to take the rocker arm. This arm is pivoted at the rear instead of in the center, the purpose being to secure less backward and forward motion of the scriber when it is necessary to use the adjustment, the longer leverage securing this result. The adjustment screw works against a spring underneath the rocker arm in the slot. The scriber arm is held in a new yoke which is so designed that it will slide easily on the spindle



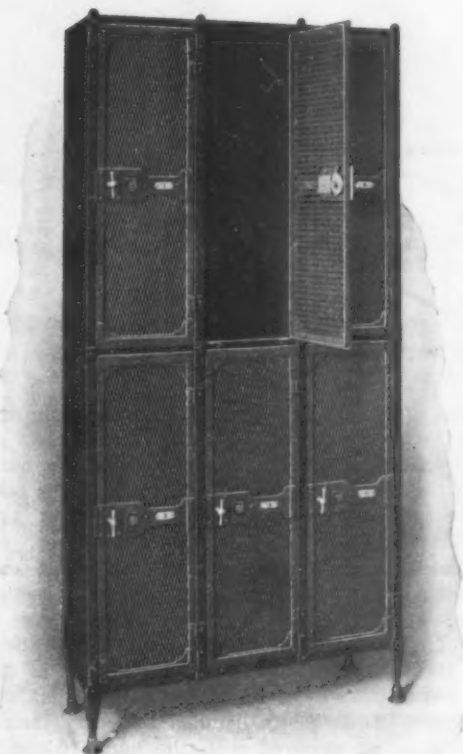
*Sawyer Surface Gauge.*

much the same as if the spindle were ground. The auxiliary base replaces the usual plugs. It is held in place when its use is desired by a thumbscrew working in a groove at either side of the base. The auxiliary base is reversible, one edge being straight, the other milled at an angle so that it may be used on a shaft or other round piece of any size, thus accomplishing, according to the claim, what cannot be done with plugs when the round piece is of small diameter. The straight edge of the auxiliary base is beveled slightly at its upper edge, to allow for the presence of a burr on the edge of the

surface against which it rests. This tool is manufactured by the Sawyer Tool Mfg. Company, Fitchburg, Mass.

### Standard Two-Tier Lockers.

Narragansett Machine Company, Providence, R. I., is manufacturing one and two tier fireproof lockers of steel, the principal new feature being the rounded surface. In the accompanying cut is illustrated the standard pattern of two-tier lockers, which also represents the general constructive features of the one-tier style. In both the partitions, backs, tops and shelves are sheet steel, folded and reinforced to secure strength, stiffness and uniformity, and secured by bolts inside of the lockers only. Raw edges of metal are turned in to prevent injury to clothing or person. The lockers are finished in enamel, which, it is stated, will not flake or scale, and are made to conform to sanitary and insurance requirements. Lockers are made strictly on the unit plan, and by special machines that insure the exact location of every hole, so that they are especially easy to erect. As many lockers, or units, can be joined in line as desired, the partitions, backs and floors following each other in suc-



Standard Two-Tier Lockers.

cession, the cabinet being completed by an end. Ten or more lockers are usually included in a cabinet. Doors are made of angle iron bent at corners and reinforced by an overlapping pressed top and bottom plate, well riveted to the angle iron. These plates, with the addition of a center plate, make a very stiff door. The center plate carries the locking device, while the number plates are of brass with sunken letters, black enamel finish. The standard make of door has expanded metal filling, as shown in the illustration, but sheet steel doors with panels punched in various styles of perforations are made to order. Legs are designed to support the lockers at a sufficient height to permit sweeping under, and are adjustable to provide for uneven floors. Each locker is provided with two japanned three-prong hooks, especially designed to hold clothing without crowding. For forced ventilation, locker backs are furnished with adjustable disk openings, permitting the adjustment of air flow for each locker. Two-tier lockers are made in eight stock sizes, and the one-tier lockers in four stock sizes. The choice of one of six kinds of locks is allowed on either style of locker. The goods are shipped knocked down.

### The Standard Wagon.

Standard Novelty Works, Duncannon, Pa., is offering the wagon illustrated herewith. The fifth wheel, Fig. 2, is constructed so as to be unbreakable by the severest use the wagon may be put to. No matter whether the king



Fig. 1.—The Standard Wagon.

bolt is in or out it cannot be detached. The maker says it puts the bolt in, but it cannot break or shear off, thus avoiding 9 out of 10 accidents. The fifth wheel can be detached only when the tongue is turned directly under the wagon. Attention is directed to the truss on top of the axle and the wide heavy tongue brace. The wheels,

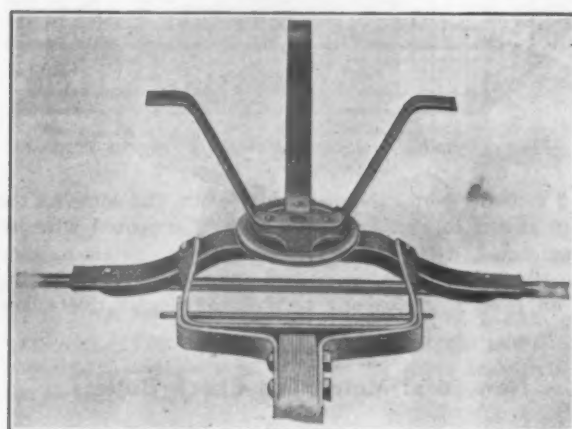


Fig. 2.—Fifth Wheel of Standard Wagon.

Fig. 3, have very heavy rims, electrically welded, the holes drilled and counter bored, allowing the heads of the spokes to fit snugly to prevent the heads wearing or jumping off. The 16 spokes are made of high grade wire. The hubs are designed so that the spokes can be drawn to the highest possible tension and remain so. The wagon

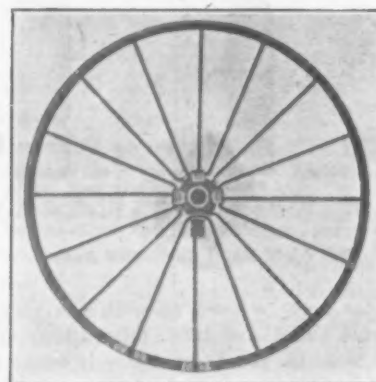


Fig. 3.—Standard Wagon Wheel.

box has sides made of steel, with hardwood molding covering the upper edges, secured by nickel plated corner irons, so as to keep it from denting, bending or getting out of shape. The bottom of the body is of wood and the whole is nicely painted.



### Smith's Improved Rat Traps.

Detroit Wire & Iron Works, Detroit, Mich., are offering the new rat traps shown in the accompanying cuts. The trap illustrated in Fig. 1 is made of  $\frac{1}{2}$ -in. galvanized wire

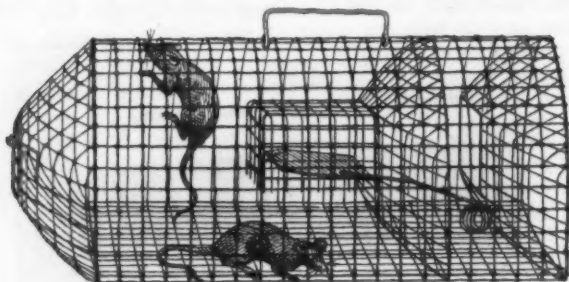


Fig. 1.—Smith's Never Escape Rat Trap.

cloth, including all exterior and interior parts, the cloth being soldered at every joint to make the escape of rats impossible. Wires protrude below the part in which the tin door works, forming a sharp edge all around so that rats and mice cannot pull the doors down to escape. The improved Marty pattern trap, Fig. 2, has interior



Fig. 2.—Smith's Improved Marty Pattern Rat Trap.

and ends of  $\frac{1}{2}$ -in. galvanized wire cloth, the same as the trap shown in Fig. 1, with a body of coppered wire, so constructed, it is explained, that it is impossible to slide the ribs up or down, or to pull the wires apart, making it an exceedingly strong trap at a comparatively low price.

### New Ideal Metal Gas Check Bullets.

Ideal Mfg. Company, New Haven, Conn., has added to its line molds, reloading tools and metal gas checks for reloading shells in .25 caliber rifles, shown in the accompanying cuts. Bullet No. 257,312 is for 25-20 Single Shot, 25-20 Repeater, 25-21, 25-25 Stevens rifles. Bullet No. 257,306 is for 25-35 Winchester and 25-36 Marlin rifles. With these bullets the same charge of high

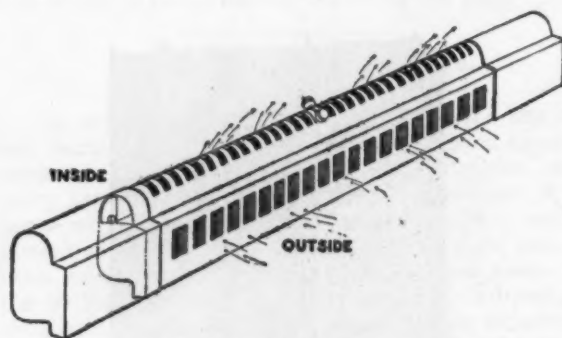


New Ideal Metal Gas Check Bullets.

power powder may be used as with the regular H. P. metal jacketed bullet, and it is claimed they are fully as accurate or more so, and the velocity is equal to the full high power ammunition. It is further claimed by the manufacturer that while the regular hard metal covered bullets soon wear out the H. P. rifle barrels, these cast bullets will greatly prolong their use. Bullet No. 311,299 is for the 303 British rifles, using proportionately the same charge of L. & R. Lightning powder as bullet No. 308,284 in the United States Krag rifle.

### The Zephyr Window Ventilator.

The ventilator illustrated in the accompanying cut is being placed on the market by the Zephyr Ventilator Mfg. Company, Incorporated, Philadelphia, Pa. It is designed for use in private residences, offices, schools, hospitals, factories, and, in fact, in all buildings where proper ventilation is desired. The device is simply and strongly made of cold rolled sheet steel heavily copper plated, with an antique bronze finish. There is no wood about the device which might warp or crack, and the claim is made that it is not affected by any kind of weather. A dustproof screen of fine mesh copper wire on the outside face of the ventilator admits the air and keeps out dirt and impurities. The finely adjustable, protected, noiseless slide on the top of the inside of the ventilator controls the supply of pure air, sending it up along the inner surface of the sash instead of straight out into the room. It is pointed out that whether wide open or nearly closed this control positively prevents any dangerous draft. The device is placed on the sill, with the outside face exposed to the open air, and then the lower sash is brought down tight upon the ledge indicated; the top



Zephyr Window Ventilator.

openings of the ventilator are within the room and close to the inner surface of the sash. The arrows indicate the direction of the air currents from the outside to within the room. The automatic drain in the bottom of the ventilator carries off any rain, sleet or snow that may get through the outside screen, so that the device is practically self-cleaning. The ends are adjustable, are continuous with the main section, and do not affect in any way the strength or appearance of the ventilator. The position of the device under the lower sash of the window is such as to be entirely out of the way of the closest fitting curtain or window shade. It is easily handled and may instantly be put in place or removed with the hands without tools. Only about 2 in. of the device shows beneath the window sash from the outside and little more inside. There are no complicated parts to get out of order, and it is built strong enough to withstand the impact of the heaviest sash dropping upon it. The company points out that each ventilator turned out is made to fit the window so neatly that there are no cracks or spaces around it to allow of any irregular drafts, dirt, dust or water. Repeated practical tests are said to have shown that the ventilator not only keeps the air fresh, but clears any room of all foul air or even smoke within a few moments after it is placed in the window. The ventilator is made in three sizes, the smallest being for windows 26 to 32 in. wide; the second size for windows 32 to 38 in., and the largest size for windows 38 to 44 in. wide. Still larger sizes will be made to order.

### Chicago Recording Time Lock and Bolt.

The accompanying cut, Fig. 1, illustrates the recording time lock, made by Chicago Recording Time Lock Company, Chicago, Ill. It may be installed on any door, and is used in the same manner as any ordinary lock, with the exception that every time it is locked or unlocked it

prints on a slip of paper inclosed within the cabinet the exact time represented by the minute, hour, day of the month and year. It also registers the key used, different keys being designated by the letters A, B, C and D, thus recording every locking and unlocking of the door, and showing when and by whom it was done. The advantages of this record in preventing the entrance of



Fig. 1.—Chicago Recording Time Lock.



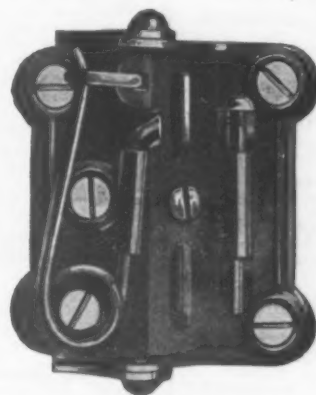
Fig. 2.—Chicago Recording Bolt.

premises without the owner's knowledge and in insuring promptness, regularity and attention to duty on the part of employees, watchmen, &c., are obvious. Proof is given as to when a place of business is opened in the morning and who opened it, when it is closed at night and who closed it, whether any one comes in or goes out during the night, and, if so, who it was and when. There is also a registry for an outside watchman, which, without the unlocking of the door, will show each time he examines the premises. The mechanism of the lock is elec-

trically controlled by a self-winding clock that may be hung on the wall anywhere in the store or office. The time wheels of the lock move each minute in harmony with the time piece. Windows and entrances other than the one on which recording locks are placed, are covered by the use of recording bolts, Fig. 2, the numbers of which change every time the bolt is unlocked, but not when it is locked. The counting device fitted to the bolt is inexhaustible, registering up to 99,999 and then reversing itself and commencing again. This bolt can be attached not only to windows and doors, but to any opening which it is desirable to guard against indiscriminate access, such as storerooms, linen and silver closets, refrigerators, desks, &c.

### The Arcade Detachable Holdback Spring Hinge No. 80.

The accompanying illustration represents a detachable holdback spring hinge manufactured by the Arcade Mfg. Company, Freeport, Ill. It is made entirely of steel, and the spring is firm and active in both forward and backward action. No tools are needed to take off a door,



The Arcade Detachable Holdback Spring Hinge No. 80.

the removal of a small pin only being necessary, when a small part of the hinge, the same color as the house, is left in place. The hinges are packed one dozen pairs in a paper box, one gross in a case, the gross weight of which is 70 lb.

## PAINTS, OILS AND COLORS

### Animal, Fish and Vegetable Oils—

	gal	lb
Linseed, City, raw.....	42	@43
City, Boiled.....	43	@44
State and Western, raw.....	41	@42
Raw Calcutta, in bbls.....	40	@41
Lard, Extra Prime, Winter.....	76	@77
Extra No. 1.....	50	@51
No. 1.....	44	@45
Cotton-seed, Crude, f.o.b. mills.....	40 1/2	@40 1/2
Summer Yellow, Prime.....	40 1/2	@40 1/2
Summer White.....	47	@48
Sperm, Crude.....	52	@53
Natural Winter.....	55	@56
Bleached Winter.....	58	@59
Bleached Winter, Extra.....	70	@71
Tallow, Prime.....	55	@56
Whale, Crude.....	35	@36
Natural Winter.....	45	@46
Bleached Winter.....	47	@48
Extra Bleached Winter.....	49	@50
Menhaden, Brown, Strained.....	29	@30
Light, Strained.....	29	@30
Northern.....	28	@29
Southern.....	27	@28
Cocanut, Ceylon.....	9 lb 9 1/2	@9 1/2
Cochin.....	9 lb 9 1/2	@9 1/2
Cod, Domestic, Prime.....	30	@31
Newfoundland.....	34 1/2	@35
Red, Elaine.....	45	@46
Saponified.....	9 lb 6	@9 1/2
Olive, Italian, bbls., Yellow.....	66	@67
Nestlefoot, Prime.....	49	@50
Palm, Lagos.....	7 lb 7	@7 1/2

### Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	10 1/2	@11 1/2
29 gravity, 15 cold test.....	11 1/2	@12 1/2
Summer.....	10 1/2	@11 1/2
Cylinder, light filtered.....	18	@19
Dark, filtered.....	16	@17
Paraffine, 903-907 gravity.....	13 1/2	@14
903 gravity.....	12 1/2	@13
905 gravity.....	10 1/2	@11 1/2
Red.....	12 1/2	@13

### Miscellaneous—

Barytes:		
White, Foreign.....	10 ton	\$18.50@20.00
Amer. floated.....	10 ton	19.00@20.00
Off color.....	10 ton	11.50@15.50
Chalk, in bulk.....	10 ton	3.00@3.25
In bbls.....	100 lb	35
China Clay, English.....	10 ton	11.00@17.50
Cobalt, Oxide.....	100 lb	2.50@2.80
Whiting, Commercial.....	100 lb	.43@.52
Gilders.....	100 lb	.55@.65
Ex. Gilders.....	100 lb	.60@.70
Putty, Commercial—	100 lb	
In bladders.....	\$1.70	@1.85
In bbls. or tubs.....	1.20	@1.40
In 1 lb to 5 lb cans.....	2.65	@2.95
In 12 1/2 to 50 lb cans.....	1.90	@1.90
Spirits Turpentine—	gal.	
In Oil bbls.....	70 1/2	@71 1/2
In machine bbls.....	71	@71 1/2
Glue—		
Cabinet.....	12	@15
Common Bone.....	7	@9
Extra White.....	18	@24
Foot Stock, White.....	12	@14
Foot Stock, Brown.....	9	@11
German Hide.....	12	@18
French.....	10	@10
Irish.....	13	@16
Low Grade.....	10	@12
Medium White.....	14	@17
Gum Shellac—		
Bleached Commercial.....	47	@48
Bones, Dried.....	37	@58
Button.....	40	@60
Diamond I.....	53	@55
Fine Orange.....	52	@55
A. C. Garnet.....	44	@45
Kala Button.....	37	@58
D. C.....	59	@60
Octagon B.....	48	@51
T. N.....	47	@48
V. S. O.....	46	@56
Colors in Oil—		
Black, Lampblack.....	12	@14
Rhine, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	12	@16
Green, Paris.....	12	@16
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

### White Lead, Zinc, &c.—

Lead, American White:		
Lots of 500 lb or over, in Oil.....	@ 7 1/2	
Lots less than 500 lb, in Oil.....	@ 8	
Lead, English white, in Oil.....	9 1/2	@10
Lead, White, in oil, 25 lb tin pails, add to keg price.....	@ 1/2	
Lead, White, in oil, 12 1/2 lb tin pails, add to keg price.....	@ 1	
Lead, White, in oil, 1 to 5 lb am'ted tins, add to keg price.....	@ 1 1/4	
Lead, American, Terms: For lots 12 tons and over 1/4¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.....	9 1/2	
Zinc, American, dry.....	5 1/2	@5 1/2
Zinc, French:		
Antwerp, Red Seal, dry.....	8 1/2	
Antwerp, Green Seal, dry.....	10 1/2	
Paris, Red Seal, dry.....	9 1/2	
Paris, Green Seal, dry.....	11	
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	13 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@13 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/2	@12 1/2
Lots of less than 1 ton.....	12 1/2	@12 1/2
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or mixed grades 1%: 25 bbls. 2%; 50 bbls., 4%.		
Dry Colors—		
Black, Carbon.....	6 1/2	@11
Black, Dron, American.....	4	@6
Black, Dron, English.....	5	@15

Black, Ivory.....	16	@20
Lamp, Com.....	4	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	37	@38
Blue, Prussian.....	28	@32
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	1 1/2	@1
Carmine, No. 40.....	\$3.10	@3.25
Green, Chrome, ordinary.....	3 1/2	@7
Green, Chrome, pure.....	17	@25
Lead, Red, bbls., 1/2 bbls., kegs.....	@ 7 1/2	
Litharge, bbls., 1/2 bbls., kegs.....	@ 7 1/2	
Ocher, American.....	10 ton	\$3.50@16.00
American Golden.....	2 1/2	@3 1/2
French.....	1 1/2	@2
Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
French.....	10 1/2	@12
German.....	8 1/2	@10
American.....	8 1/2	@8 1/2
Red, Indian, English.....	4 1/2	@6
American.....	3	@3 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100 lb	\$2.50@1.25
English.....	100 lb	\$1.15@1.75
Sienna, Italian, Burnt and Powdered.....	3	@9 1/2
Italian, Raw, Powdered.....	3	@9 1/2
American, Raw.....	1 1/2	@2
American Burnt and Pow'd.....	1 1/2	@2
Talc, French.....	10 ton	\$17.00@25.00
American.....	10 ton	17.00@25.00
Terra Alba, French.....	100 lb	.90@1.00
English.....	100 lb	.80@1.00
American.....	100 lb	.75@.80
American.....	100 lb	.60@.65
Umber, T'key, Int. & Pow'd.....	2 1/2	@3 1/2
Turkey, Raw and Powdered.....	2 1/2	@3 1/2
Burnt, American.....	1 1/2	@2
Raw, American.....	1 1/2	@2
Yellow Chrome.....	12 1/2	@15
Vermilion, American Lead.....	10	@25
Quicksilver, bulk.....	65	@65
Quicksilver, bags.....	65	@65
English, Imported.....	65	@70
Chinese Imported.....	\$2.90	@1.00



# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33%  
North's.....10%  
Zimmerman—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Taplin's Perfection.....35%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers,  $\frac{1}{2}$  doz. pairs, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2

**Calipers—See Compasses.****Calks, Toe and Heel—**

Blunt, 1 prong... per lb. 4¢  
 Sharp, 1 prong... per lb. 4¢  
 Burke's Blunt, 4¢; Sharp, 4¢  
 Gautier, blunt, 4¢; Sharp, 4¢  
 Perkins, Blunt, 1 lb. 3.65¢; Sharp, 4.15¢

**Can Openers—**

See Openers, Can.

**Cans, Milk—**

5 8 10 gal.  
 Illinois Pattern... 1.55 1.85 2.05 each.  
 New York Pattern... 1.50 2.20 2.45 each.  
 Baltimore Pattern... 1.50 2.20 2.45 each.  
 Dubuque... 1.35 1.60 1.75 each.

**Cans, Oil—**

Buffalo Family Oil Cans:  
 5 10 gal.  
 \$18.00 60.00 129.00 gro. net.

**Caps, Percussion—**

Eley's E. B. 50¢/55¢  
 G. D. 50¢/55¢  
 F. L. 50¢/55¢  
 G. E. 50¢/55¢  
 Musket 50¢/55¢

**Primers—**

Berdan Primers, 3¢ per M. 20¢/5¢  
 Primer Shells and Bullets... 15¢/10¢  
 All other primers per M. \$1.50/1.60

**Cartridges—**

Blank Cartridges:  
 32 C. F., \$5.50... 10¢/5¢  
 38 C. F., \$7.00... 10¢/5¢  
 22 col. Rim, \$1.50... 10¢/5¢  
 32 col. Rim, \$2.75... 10¢/5¢  
 B. B. Caps, Con. Ball, Sued. \$1.50  
 B. B. Caps, Round Ball... \$1.40  
 Central Fire... 15¢  
 Target and Sporting Rifle... 15¢/5¢  
 Primed Shells and Bullets... 15¢/5¢  
 Rim Fire, Sporting... 50¢  
 Rim Fire, Military... 15¢/5¢

**Castors—**

Bed 70¢/70¢/10¢  
 Plate 60¢/10¢/10¢/5¢  
 Philadelphia 75¢/75¢/10¢  
 Acme, Ball Bearing... 33¢  
 Boss 70¢/10¢  
 Boss Anti-Friction... 70¢/10¢  
 Gem (Roller Bearing)... 60¢  
 Martin's Patent (Phoenix)... 45¢  
 Standard Ball Bearing... 30¢  
 Tucker's Patent low list... 30¢  
 Yale (Double Wheel) low list... 30¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Straight Link:  
 3-16 3-16 5-16 3-16 7-16 3-16 9-16  
 39.15 6.30 5.25 4.35 4.35 4.15 4.10  
 3/4 3/4 3/4 1 1-16 1 1/4 1 1/4 inch.  
 \$4.00 3.50 3.55 60¢/10¢/10¢/70¢  
 German Coil... 60¢/10¢/10¢/70¢

**Halter—**

Halter Chains... 60¢/60¢/5¢  
 German Pattern Halter Chains,  
 list July 24, '97... 60¢/10¢/5¢  
 Covert Mfg. Co. 35¢/5¢  
 Halter 35¢/5¢

**Cow Ties—**

See Halters and Ties.

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
 6 1/2-6 3/4, Straight, with ring, \$27.00  
 6 1/2-6 3/4, Straight, with ring, \$25.00  
 6 1/2-8 3/4, Straight, with ring, \$32.00  
 6 1/2-10-2, Straight, with ring, \$37.00

NOTE—Add 3¢ per pair for Hooks.  
 Ties, Traces, add per pair for Nos. 2 and 3, 2¢; No. 1, 3¢; No. 4, 4¢ to price of Straight Link.

Eastern Standard Traces, Wag-  
 on Chain, &c... 60¢/5¢

**Miscellaneous—**

Jack Chain, list July 10, '93:  
 Iron... 60¢/10¢  
 Brass... 60¢/5¢  
 Safety and Plumbers' Chain, 70¢  
 Gal. Pump Chain... 10¢/4¢  
 Covert Mfg. Co.:  
 Breast, Halter, Heel, Rein, Stal-  
 lion... 40¢  
 Oneida Community:  
 Am. Dog Leads and Kennel Chains,  
 100¢/40¢/5¢  
 Niagara Dog Leads and Kennel  
 Chains... 40¢/40¢/5¢  
 Wire Goods Co.:  
 Dog Chain... 70¢/10¢  
 Universal Dbl.-Jointed Chain... 50¢  
**Chain and Ribbon, Sash—**  
 Oneida Community:  
 Copper Chain, 60¢/5¢; Steel Chain,  
 60¢  
 Pullman:  
 Bronze Chain, 60¢; Steel Chain,  
 60¢/10¢  
 Brass Chain Attachments, per set, 5¢  
 Aluminum Sash Ribbon, per 100  
 ft... \$1.25/\$3.00  
 Sash Ribbon Attachments, per set, 5¢  
**Chalk—(From Jobbers.)**  
 Carpenters' Blue... 50¢/55¢  
 Carpenters' Red... 45¢/50¢  
 Carpenters' White... 40¢/45¢

**Checks, Door—**

Barley's... 45¢  
 Pullman, per 100... 35¢/40¢  
 Russwin... 33¢/4¢

**Chests, Tool—**

American Tool Chest Co.:  
 Boys' Chests, with Tools... 55¢  
 Youths' Chests, with Tools... 40¢  
 Gentlemen's Chests, with Tools... 30¢  
 Farmers', Carpenters', etc., Chests  
 with Tools... 20¢

Machinists' and Pipe Fitters'  
 Chests, Empty... 50¢  
 Tool Cabinets... 50¢  
 C. E. Jennings & Co.'s Machinists'  
 Tool Chests... 33¢/40¢

**Chisels—**

Socket Framing and Firmer  
 Standard List... 75¢/75¢/5¢  
 Buck Bros... 30¢  
 Charles Buck Edge Tool Co... 30¢  
 C. E. Jennings & Co. 10... 60¢  
 Socket Firmer No. 10... 60¢  
 Socket Framing No. 15... 60¢  
 Swan's... 75¢  
 L. & I. J. White Co... 30¢/30¢/5¢

**Tanged—**

Tanged Firmers... 40¢  
 Buck Bros... 30¢  
 Charles Buck Edge Tool Co... 30¢  
 C. E. Jennings & Co. Nos. 191, 181, 25¢  
 L. & I. J. White Co... 25¢/5¢

**Cold—**

Cold Chisels, good quality, 19¢/15¢  
 Cold Chisels, fair quality, 11¢/12¢  
 Cold Chisels, ordinary... 9¢/10¢

**Chucks—**

Almond Drill Chucks... 35¢  
 Almond Turret Six-Tool Chuck... 40¢  
 Beach Pat., each \$8.00... 35¢/5¢  
 Empire... 25¢  
 Blacksmiths'... 25¢  
 Jacobs' Drill Chucks... 25¢  
 Pratt's Positive Drive... 25¢  
 Skinner Patent Chucks:  
 Independent Lathe Chucks... 40¢  
 Universal, Reversible Jaws... 40¢  
 Combination, Reversible Jaws... 40¢  
 Drill Chucks, New Model, 25¢  
 Standard, 40¢/10¢; Skinner Pat.,  
 25¢; Positive Drive... 40¢  
 Planer Chucks... 40¢  
 Face Plate Jaws... 40¢  
 Standard Tool Co.:  
 Improved Drill Chuck... 45¢  
 Union Mfg. Co.:  
 Combination, Nos. 1, 2, 3, 4, 5, 6,  
 7, 8 and 17, 40¢; No. 21... 35¢  
 Scroll Combination, Nos. 12 and  
 34... 30¢  
 Geared Scroll, Nos. 33, 34 and 35, 30¢  
 Independent Iron, Nos. 18 and 318, 35¢  
 Independent Steel, No. 61... 25¢  
 Union Drill, Nos. 000, 00, 100, 101,  
 102, 103, 104... 30¢  
 Union Gear Drill... 30¢  
 Universal 11, 12, 16, 17, 18, 14, 15, 30¢  
 Universal, No. 43... 30¢  
 Iron Face Plate Jaws, Nos. 28, 30,  
 48 and 50... 35¢  
 Steel Face Plate Jaws, Nos. 70 and  
 72... 30¢  
 Westcott Patent Chucks:  
 Lathe Chucks... 50¢  
 Little Giant Auxiliary Drill... 50¢  
 Little Giant Double Grip Drill... 50¢  
 Little Giant Drill, Improved... 50¢  
 Oneida Drill... 50¢  
 Scroll Combination Lathe... 50¢

**Clamps—**

Adjustable, Hammers... 20¢/20¢/5¢  
 Carriage Makers', P., S. & W.  
 Co... 40¢/40¢/50¢  
 Beely, Parallel... 35¢/40¢/10¢  
 Lincman's, Ulica Drop Forge & Tool  
 Co... 40¢  
 Wood Workers, Hammers... 40¢/10¢  
 Saw Clamps, see Vises, Saw Filers

**Cleaners, Drain—**

Iwan's Champion, Adjustable... 55¢  
 Iwan's Champion, Stationary... 45¢

**Sidewalk—**

Star Socket, All Steel... 40¢/5¢  
 Star Shank, All Steel... 40¢/5¢  
 W. & C. Shank, All Steel, 40¢/5¢  
 7 1/2 in., \$3.00; 5 in., \$2.25

**Cleavers, Butchers'—**

Poster Bros... 30¢  
 Fayette R. Plumb... 30¢  
 L. & I. J. White Co... 30¢

**Clippers, Horse and****Sheep—**

Chicago Flexible Shaft Company:  
 1902 Chicago Horse, each, \$10.75  
 20th Century Horse, each, \$5.00  
 Lightning Belt Horse, each, \$15.00  
 Chicago Belt Horse, each, \$20.00  
 Stewart's Enclosed Gear  
 Horse, each... \$17.75  
 Stewart's Patent Sheep Shear-  
 ing Machine, each... \$12.75  
 Stewart Enclosed Gear Shear-  
 ing Machine, No. 8, each, \$9.75

**Clips, Axle—**

Regular Styles, list July 1, '05.80¢

**Cloth and Netting, Wire**

—See Wire, &amp;c.

**Cocks, Brass—**

Hardware Hat:  
 Plain Bibbs, Globe, Kerosene,  
 Racking, Liquor, Bottling,  
 &c... 70¢  
 Compression Bibbs... 65¢/10¢

**Coffee Mills—**

See Mills, Coffee.

**Collars, Dog—**

Nickel Chain, Walter B. Stevens &  
 Son's list... 40¢  
 Leather, Walter B. Stevens & Son's  
 list... 60¢

**Combs, Curry—**

Metal Stamping Co... 40¢

**Compasses, Dividers, &c.**

Ordinary Goods... 70¢/10¢/75¢  
 Wm. Scholhorn Co.:  
 Folding Dividers... 55¢  
 Lock Dividers... 75¢

**Conductor Pipe,—**

L. C. L. to Dealers:

Galv.	Charcoal	Copper.
Steel.	Iron.	14, 16, 18 oz.
Eastern:		
70¢/2 1/2%	60%	30¢/10%
Central:		
65¢/12 1/2%	55¢/5%	30¢/7 1/2%
Western and Southern:		
65¢/7 1/2%	55%	30¢/5%
So. Western:		
62 1/2¢/5%	50¢/2 1/2%	30¢/2 1/2%

Terms, 60 days; 2% cash 10 days. Fac-  
 tory shipments generally delivered.  
 See also Eave Troughs.

**Coolers, Water—**

Gal.	each.	2	3	4	6	8
Labrador	\$1.20	\$1.50	\$1.80	\$2.10	\$2.70	
Gal.						
Iceland, ea.	\$1.30	\$2.10	\$2.40	\$3.00		
Gal.						
Galvanized, ea.	\$1.85	\$2.00	\$2.25	\$2.50	\$3.30	
Gal.						
Each	\$1.95	\$2.15	\$2.40	\$3.30	\$1.15	
White Enamelled, 25%; Agate Lined, 25%						

**Coopers' Tools—**

See Tools, Coopers.

**Coopers' Soldering—**

Soldering Coppers, 3 lbs. to pair  
 and heavier, 30¢/31¢; lighter  
 than 3 lb. to pair... 32¢/33¢

**Cord—Sash—**

Braided, Drab... 10¢/35¢  
 Braided, White, Com. Nos. 8  
 to 12, 25¢; No. 7, 25¢/4¢; No. 6,  
 26¢/4¢

**Cable Laid Italian, lb., No. 18,**

Italian, lb., A, No. 18, 25¢; B, 21¢  
 Common India... 10¢/10¢/4¢  
 Cotton Sash Cord, Twisted, 17¢/19¢  
 Patent Russia... 19¢  
 Cable Laid Russia... 19¢  
 India Hemp, Br'd'd... 19¢  
 India Hemp, Twisted, lb. 12¢/13¢  
 Patent India, Twisted... 16¢  
 Aniston Cordage Co.: 10 lb. solid  
 Braided, Nos. 8 to 12, \$0.21; No. 7,  
 \$0.24; No. 6, \$0.25; 1/2 doz., 50 ft.,  
 \$0.10; 50 ft., Columbia, \$0.85;  
 50 ft., Victoria, \$1.00; 50 ft., 6-Thread,  
 \$1.10; 50 ft., 5-Thread, \$0.95; 50 ft.,  
 Manila, \$1.40; 50 ft., Jute, \$0.75.  
 Pearl Braided, cotton, No. 6, 30 lb.,  
 25¢/4¢; No. 7, 25¢/4¢; No. 8 to 12, 24¢/4¢  
 Eddystone Braided, Nos. 8 to 10,  
 25¢/4¢; 7, 25¢/4¢; 6, 26¢/4¢  
 Harmony Cable Laid Italian, Nos. 7  
 to 12, 25¢/4¢

**Pullman—**

Wire Sash Cord... 19¢  
 Sash Cord Attachments, per doz. 10¢  
 Samson, Nos. 8 to 12:  
 Braided, 10 lb. Drab Cotton,  
 55¢; Italian Hemp, 40¢/4¢  
 50¢; Lined, 50¢; White Cot-  
 ton, 50¢; Spot Cord... 50¢  
 Massachusetts, White... 10¢/40¢  
 Massachusetts, Drab... 10¢/45¢  
 No. 7, 28¢; No. 6, 30¢.  
 Phoenix, White, Nos. 8 to 12, 27¢;  
 Silver Lake, per lb.:  
 A, Drab, 45¢; B, White, 35¢;  
 C, Drab, 40¢; D, White, 35¢;  
 Italian Hemp, 40¢; Lined... 57¢/4¢  
 See also Chain and Ribbon.

**Wire, Picture—**

List July 12, 1906... 85¢/10¢/10¢  
 Hendryx Standard Wire Picture Cord,  
 old list, 85¢/10¢

**Cradles—**

Grain... 40¢/12 1/2%

**Crayons—**

White Round Crayons, Cases, 100  
 gro., \$6.50/\$7.50 at factory, but  
 lower prices made by jobbers  
 Zelnicker's Lumber... 30¢ gro.  
 White and Purple, Indelible... \$7.50  
 Blue, Red, Green, Yellow and  
 Terra Cotta, \$6.50; Black... \$4.00  
 Genuine Soapstone, Metal Workers',  
 5 in. x 3/4 in. Round, \$2.50; 5 in. x  
 1/2 in. Square, \$1.75; 5 in. x 1/2 x 3-16,  
 \$2.50; 5 in. x 1/4 x 3-16... \$3.00

**Crooks, Shepherds'—**

Fort Madison, per doz., Heavy, \$7.00;

Light... \$6.50

**Crow Bars—See Bars, Crow.****Cultivators—**

Victor Garden... 50%

**Cutlery, Table—**

International Silver Company:

No. 12 M'd'm Knives, 1817, 40¢/30¢  
 Star, Eagle, Rogers & Hamilton  
 and Anchor... 30¢/30¢  
 Wm. Rogers & Son... 40¢/22.50

**Cutters—Glass—**

H. H. Mayhew Co... 40¢  
 Red Devil... 50¢  
 Smith & Hemenway Co... 50¢  
 Woodward... 40¢

**Meat and Food—**

American... 30¢  
 Nos. 401 402 403 404 405 406 407  
 Each... \$5 \$7 \$10 \$12 \$25 \$30 \$60  
 Enterprise:  
 Nos. 3 10 12 22 32  
 Each... \$2 \$3 \$7.75 \$4.50 \$6.25 \$5.75 \$4  
 No. 202... \$1.50  
 Dixon's... 40¢/30¢/30¢/5¢  
 Nos. 1 2 3 4  
 Ideal... \$14.00 \$17.00 \$19.00 \$30.00  
 Little Giant... 40¢/40¢/50¢  
 Nos. 305 310 312 320 322  
 \$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
 N. E. Food Choppers... 25¢  
 New Triumph No. 605, 40¢/21.00  
 Russwin Food, No. 1, \$21.00; No. 2,  
 \$27.00  
 Woodruff's... 40¢/30¢/30¢/5¢  
 Nos. 100 150  
 Enterprise Beef Shavers... 25¢/30¢

**Slaw and Kraut—**

Henry Diston & Sons:  
 Slaw and Kraut Cutters... 35¢  
 Corn Graters... 30¢  
 J. M. Mast Mfg. Co.:  
 Slaw Cutters, 1 Knife... 40¢/30¢  
 Combined Slaw Cutter and Corn  
 Grater... 40¢/30¢  
 Tucker & Dorsey Mfg. Co.:  
 Kraut Cutters... 40¢  
 Slaw Cutters, 1 Knife... \$18¢/50¢  
 Slaw Cutters, 2 Knife... \$22¢/50¢

**Tobacco—**

All Iron, Cheap... doz. \$1.25/\$1.50  
 Enterprise... 25¢/30¢  
 National, 40¢/30¢, No. 1, \$21; No. 2,  
 \$18

**Diggers, Post Hole, &c.—**

Diston's:  
 Rapid, 40¢/30¢, \$24.00... 25¢  
 Samson, 40¢/30¢, \$34.00... 25¢  
 Iwan's Improved Post Hole Auger... 40¢/30¢  
 Vaughan Pattern Post Hole Augers...  
 40¢/30¢  
 Perfection Post Hole Diggers... 30¢  
 Split Handle Post Hole Diggers... 30¢  
 Kohler's, 40¢/30¢, Universal, \$14.00;  
 Little Giant, \$12.00; Hercules,  
 \$10.00; Invincible, \$9.00; Rival,  
 \$8.00; Pioneer... \$7.00  
 Never-Break Post Hole Diggers... 40¢  
 doz. \$24.00... 60%

**Dividers—See Compasses.****Drawers, Money—**

Tucker's Pat. Alarm Till No. 1, 40¢  
 doz., \$18; No. 2, \$15; No. 3, \$12;  
 No. 4, \$18.

**Drawing Knives—**

See Knives, Drawing.

**Dressers, Emery Wheel—**

Sterling Emery Wheel Dressers... 35¢

**Drills and Drill Stocks—**

Blacksmiths' Common Drilling  
 Machines... \$1.50/\$1.75  
 Breast, Millers Falls... 15¢/10¢  
 Breast, P. S. & W... 40¢  
 Goodell Automatic Drills, 50¢/10¢/60¢/10¢  
 Johnson's Automatic Drills, Nos. 2  
 and 3... 16¢/5¢  
 Johnson's Drill Points... 16¢/5¢  
 Millers Falls Automatic Drills, 33¢/10¢  
 Ratchet, Curtis & Curtis... 25¢  
 Ratchet, Parker's... 40¢/7¢  
 Ratchet, Weston's... 40¢  
 Ratchet, Weston's, Style H Im-  
 proved... 40¢  
 Ratchet, No. 012... 40¢  
 Ratchet, Celebrated... 40¢  
 Ratchet, Whitney's, P. S. & W... 50¢  
 Whitney's Hand Drill, No. 1, \$10.00;  
 Adjustable, No. 10, \$12.00... 33¢/4¢

**Twist Drills—**

Bit Stock... 60¢/10¢/10¢/70¢  
 Taper and Straight Shank...  
 60¢/10¢/60¢/10¢/5¢

**Drivers, Screw—**

Screw Driver Bits, per doz. 45¢/50¢  
 Balsey's Screw Holder and Driver, 40¢  
 doz., 2 1/2-in., 40¢; 4-in., 47.50; 6-in.,  
 50¢  
 Buck Bros.' Screw Driver Bits... 30¢  
 Champion... 70¢  
 Diston's... 70¢  
 Edson... 60¢  
 Fray's Hol. H'dle Sets, No. 3, \$12.50;  
 Ford's Brace Screw Drivers... 40¢/10¢  
 Gay's Double Action Ratchet... 35¢  
 Goodell's Auto... 65¢/65¢/10¢  
 Mayhew's Black Handle... 40¢  
 Mayhew's Monarch... 40¢  
 Millers Falls, Nos. 20 and 21... 25¢/10¢  
 Millers Falls, Nos. 12, 14, 15, 12¢/15¢/10¢  
 New England Specialty Co... 30¢  
 Smith & Hemenway Co., Never-  
 turn, 40¢/5¢; Elmore... 50¢  
 H. D. Smith & Co.'s Perfect H'dle... 10¢  
 Stanley R. & L. Co.'s:  
 No. 61, Varn. Handles, 60¢/10¢; No.  
 86, 70¢; Deference, 70¢; Hurwood,



## Extractors, Lemon Juice

Fasteners, Blind—  
—See Squeezers, Lemon.

Zimmerman's ..... 50&amp;10%

Walling's ..... 40&amp;10%

## Cord and Weight—

Ives ..... 33&amp;10%

## Faucets—

Cork Lined ..... 50&amp;10% 40%

Metallic Key, Leather Lined ..... 60&amp;10% 70%

Red Cedar ..... 40&amp;10% 50%

Petroleum ..... 70&amp;10% 75%

B. &amp; L. B. Co.: ..... 60&amp;10%

Metal Key ..... 50&amp;10%

Star ..... 60%

West Lock ..... 50&amp;10%

John Sommer's Peerless Tin Key ..... 40%

John Sommer's Boss Tin Key ..... 50%

John Sommer's Victor Mtl. Key ..... 50&amp;10%

John Sommer's Duplex Metal Key ..... 40%

John Sommer's Diamond Lock ..... 40%

John Sommer's I. X. L. Cork Lined ..... 50%

John Sommer's Reliable Cork Lined ..... 50&amp;10%

John Sommer's Chicago Cork Lined ..... 60%

John Sommer's O. K. Cork Lined ..... 50%

John Sommer's No Brand, Cedar ..... 40%

John Sommer's Perfection, Cedar ..... 40%

McKenna, Brass: ..... 25%

Burglar Proof, N. P. ..... 25%

Improved, 1/2 and 1/4 inch ..... 25%

Self Measuring ..... 40&amp;10%

Enterprise, 1/2 doz. \$36.00 ..... 40&amp;10%

Lane's, 1/2 doz. \$36.00 ..... 40&amp;10%

National Measuring, 1/2 doz. \$36.00 ..... 40&amp;10%

## Felloe Plates—

See Plates, Felloe.

## Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&amp;10% 75&amp;10%

Standard Brands ..... 75&amp;10% 75&amp;10%

Lower Grade ..... 75&amp;10% 80&amp;10%

## Imported—

Stubs' Tapers, Stubs' list, July

24, '97 ..... 33 1-3 40%

## Fixtures, Fire Door—

Richards Mfg. Co.: ..... 30%

Universal, No. 103; Special, No.

104 ..... 33.75

Fusible Links, No. 90 ..... 30%

Expansion Bolts, No. 107 ..... 60&amp;10%

## Grindstone—

Net Prices:

Inch ..... 15 17 19 \$1

Per doz. .... \$3.25 3.75 4.25 4.75

P. S. &amp; W. Co. .... 30&amp;10%

Reading Hardware Co. .... 60%

Stowell's Giant Grindstone Hanger ..... 60%

Stowell's Grindstone Fixtures, Extra

Heavy, 40&amp;10%; Light ..... 50%

## Fodder Squeezers—

See Compressors.

## Forks—

NOTE.—Manufacturers are

selling from the list of September

1, 1904, but many jobbers are still

using list of August 1, 1899, or

selling at net prices.

Iowa Dig-Ezy Potato ..... 60&amp;10%

Victor, Hay ..... 60&amp;15&amp;2%

Victor, Manure ..... 60%

Victor, Header ..... 60%

Champion, Hay ..... 60%

Champion, Header ..... 60&amp;15&amp;2%

Champion, Manure ..... 60&amp;15&amp;2%

Columbia, Hay ..... 60&amp;20%

Columbia, Manure ..... 70%

Columbia, Spading ..... 70&amp;12%

Hawkeye Wood Barley ..... 40%

W. &amp; C. Potato Digger ..... 60&amp;10%

Acme Hay, 4 tire ..... 60&amp;10%

Acme Manure, 4 tire ..... 60&amp;10%

Dakota Header ..... 60&amp;20%

Jackson Steel Barley ..... 60&amp;20%

Kansas Header ..... 60%

W. &amp; C. Favorite Wood Barley ..... 40%

Plated.—See Spoons.

## Frames— Saw—

White, 8'x7' Bar, per doz. 75&amp;80¢

Red, 8'x7' Bar, per doz. \$1.00&amp;1.25

Red, Dbl. Brace, per doz. \$1.40&amp;1.59

## Freezers, Ice Cream—

Qt. .... 1 2 3 4 5

Each ..... \$1.30 \$1.60 \$1.90 \$2.20 \$2.50

## Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

## Fry Pans—See Pans, Fry.

## Fuse— Per 1000 Feet.

Hemp ..... \$2.75

Cotton ..... 3.20

Waterproof Spl. Taped. .... 3.65

Waterproof Dbl. Taped. .... 4.40

Waterproof Tpl. Taped. .... 5.15

## Gates, Molasses and Oil—

Stebbins' Pattern ..... 60&amp;10%

## Gauges—

Marking, Mortise, do. 50&amp;50&amp;10%

Chapin-Stephens Co.: ..... 50&amp;50&amp;10%

Marking, Mortise, do. 50&amp;50&amp;10%

Diston's Marking, Mortise, do. 67&amp;10%

Stanley R. &amp; L. Co.'s Butt and

Rabbit Gauge ..... 35%

Marking and Mortise ..... 55%

Wire, Brown &amp; Sharpe's ..... 35%

Wire, Morse's ..... 25%

Wire, P. S. &amp; W. Co. .... 30%

## Gimlets— Single Cut—

Numbered assort-

ments, per gro.

Nail, Metal, No. 1, \$2.30; 2, \$2.30

Spike, Metal, No. 1, \$4.00; 2, \$4.30

Nail, Wood Handled, No. 1, \$2.30; 2, \$2.60

Spike, Wood Handled, No. 1, \$4.30; 2, \$4.60

## Glass, American Window

See Trade Report.

## Glasses, Level—

Chapin-Stephens Co. .... 60&amp;60&amp;10%

## Glue, Liquid Fish—

Bottles or Cans, with Brush ..

International Glue Co. (Martin's) .40%

## Grease, Axle—

Common Grade ..... gro. \$1.50&amp;6.00

Dixon's Everlasting, 10-lb pails, ea.

5¢; in boxes, 1 doz., 1 lb. \$1.20;

2 lb. \$2.00; 5 lb. \$2.50

Helmet Hard Oil ..... 25%

## Griddles, Soapstone—

Pike Mfg. Co. .... 33&amp;33&amp;10%

## Grindstones—

Pike Mfg. Co.: ..... 30%

Improved Family Grindstones, 1/2

inch, 1 doz., \$2.00 ..... 33&amp;10%

Royal Mfg. Co.: ..... 30%

Aluminum Grinding Machines, each,

Nos. 01, \$1.75; 1A, \$2.50; 10,

\$5.00 ..... 30%

Aluminum Sickle Grinders, each,

Nos. 29A, \$6.00; 29A Combined,

\$6.50 ..... 30%

Aluminum Disc Grinders, each,

\$2.50 ..... 30%

## Grips, Nipple—

Perfect Nipple Grips ..... 40&amp;10&amp;2%

## Halters and Ties—

Cow Ties ..... 60&amp;50&amp;60&amp;10%

Covert Mfg. Co.: ..... 30&amp;2%

Web ..... 30&amp;2%

Jute Rope ..... 30%

Sisal Rope ..... 30%

Cotton Rope ..... 45%

Hemp Rope ..... 45%

Oneida Community: ..... 40&amp;40&amp;5%

Am. Coil and Halters ..... 45&amp;50%

Am. Cow Ties ..... 45&amp;50%

Niagara Coil and Halters ..... 45&amp;50&amp;5%

Niagara Cow Ties ..... 45&amp;50&amp;5%

## Hammers—

## Handled Hammers—

Heller's Machinists' ..... 55&amp;10&amp;55&amp;10&amp;5%

Heller's Farmers' ..... 40&amp;50&amp;40&amp;10&amp;5%

Magnetic Tack, Nos. 1, 2, 3, \$1.25;

\$1.50, \$1.75 ..... 50%

Peck, Stow &amp; Wilcox, Steel ..... 50%

Fayette R. Plumb: ..... 40%

Plumb, A. E. Nail ..... 40&amp;25&amp;40&amp;12&amp;10%

Engineers' and B. S. Hand ..... 40&amp;12&amp;40&amp;10%

Machinists' Hammers ..... 50&amp;15&amp;60&amp;5%

Riveting and Tinner's ..... 40&amp;25&amp;40&amp;12&amp;10%

## Heavy Hammers and

## Sledges—

Under 3 lb., per lb., 50¢. 80&amp;50¢ @ . . %

3 to 5 lb., per lb., 40¢. 80&amp;50¢ @ . . %

Over 5 lb., per lb., 30¢ ..... 80&amp;10&amp;50¢ @ . . %

Wilkinson's Smiths' ..... lb. 9¢ @ 10¢

## Handles—

## Agricultural Tool Handles

Axe, Pick, etc. .... 60&amp;10&amp;60&amp;10&amp;5%

Hoe, Rake, etc. .... 40&amp;45&amp;5%

Fork, Shovel, Spade, etc. .... 40&amp;45&amp;5%

Long Handles ..... 40&amp;45&amp;5%

D Handles ..... 40%

## Cross-Cut Saw Handles—

Atkins' ..... 40%

Champion ..... 50%

Diston's ..... 50%

## Mechanics' Tool Handles—

Axe, assorted ..... gro. \$2.50&amp;\$3.00

Brad Axl ..... gro. \$1.65&amp;\$1.75

Chisel Handles, Ass'd, per gro.: ..

\$2.55; Hickory ..... \$2.15&amp;\$2.40

Socket Firming, Apple, \$1.75&amp;@

\$1.95; Hickory ..... \$1.45&amp;\$1.60

Socket Framing, Hickory, ..

\$1.60&amp;\$1.75

File, assorted ..... gro. \$1.30&amp;\$1.40

Hammer, Hatchet, etc. .... 60&amp;40&amp;60&amp;10&amp;5%

Hand Saw, Varnished, doz.

80&amp;85¢; Not Varnished. .... 65&amp;75¢

## Plane Handles:

Jack, doz. 30¢; Jack, Bolted. 75¢

Fore, doz. 45¢; Fore, Bolted. 90¢

Chapin-Stephens Co.: ..... 40&amp;40&amp;10%

Chisel ..... 60&amp;65&amp;10%

File and Axl ..... 60&amp;65&amp;10%

Saw and Plane ..... 40&amp;40&amp;10%

Screw Driver ..... 40&amp;40&amp;10%

Millers Falls Adj. and Ratchet Auger

Handles ..... 20&amp;10%

Nicholson Simplicity File Handle ..

per gro. \$0.85&amp;\$1.50

## Hangers—

NOTE.—Barn Door Hangers are

generally quoted per pair, without track,

and Parlor Door Hangers per double set

with track, etc.

## Allith Mfg. Co.:

Reliable, No. 1; Allith, No. 3; Al-

lith Adjustable, No. 6; Reliable

Parlor Door ..... 50%

## Chicago Spring Butt Co.:

Friction ..... 35%

Oscillating ..... 25%

Big Twin ..... 25%

Chisholm &amp; Moore Mfg. Co.:

Baggage Car Door ..... 50%

Elevator ..... 30%

Railroad ..... 50%

Cronk &amp; Carrier Mfg. Co.:

Loose Axle, No. 10 ..... 60&amp;10%

Roller Bearing ..... 70%

Griffin Mfg. Co.:

Roller Bearing, No. 10, \$12.00 ..... 70%

Roller Bearing, No. 11, \$15.00 ..... 70%

Roller Bearing, Ex. Hy. No. 22,

\$18.00 ..... 70%

Hinged Hangers, \$16.00 ..... 60&amp;10%

Lane Bros. Co.: ..... 60&amp;10%

Parlor, Ball Bearing, \$1.00;

Standard, \$3.15; No. 105, \$2.85;

New Model, \$2.80; New Cham-

pion ..... \$2.25

Barn Door, Standard ..... 60&amp;5%

Hinged ..... net \$6.08

Covered ..... 60&amp;2%

Special ..... 70&amp;5%

Lawrence Bros.: ..... 60&amp;25%

Advance and Peerless ..... 70&amp;75%

Clipper, No. 75 ..... 60&amp;5%

Crown ..... 60&amp;25%

Cyclone-Tandem ..... net \$7.50

Easy Parlor Door, Dbl. Sets,

\$2.50; Single Sets, \$1.25 ..... 60%

Giant ..... 60%

Hummer ..... 70&amp;75%

New Cyclone, Flexible, \$16.00 ..... 60&amp;25%

New York ..... 60&amp;25%

McKinney Mfg. Co.: ..... 60&amp;10%

No. 2, Standard, \$18 ..... 60&amp;10%

Hinged Hangers, \$16 ..... 50%

Meyers' Stays Hangers ..... 60&amp;5%

Richards Mfg. Co.: ..... 60&amp;5%

Hangers, No. 47, 48, 147, 217,

60&amp;5%

Pioneer Wood Track, No. 3, \$2.25

Roller Brg's St'l Track, No. 12, \$2.25

Roller Brg's St'l Track, No. 13, \$2.50

Roller Brg's, No. 39, 41, 43,

70&amp;75%

Hero, Adj. Track No. 19, 50&amp;10%

Adjustable Track Tandem Trol-

ley Track No. 16 ..... 50&amp;10%

Seal, Steel Track No. 8 ..... \$2.25

Steel Adj. Track No. 22 ..... 60&amp;5%

Trolley B. D. No. 17, \$1.25; F,

D, No. 120, \$2.25; No. 121,

\$2.45; No. 150 ..... \$2.50

Safety Underwriters F. D. No. 101







Keuffel & Esser Co.:	
Folding, Wood.....	35&10%
Folding, Steel.....	33&10%
Larkin's Steel.....	50&10%
Larkin's Lumber.....	40%
Stanley R. & L. Co.:	
Boxwood.....	60%
Ivory.....	45%
Miscellaneous.....	80%
Zig Zag.....	40%
Zig Zag, Pin Joint.....	42%
Union Nut Co.:	
Boxwood.....	60&10%
Ivory.....	35&10%

**Sash Balances—**

See Balance, Sash.

**Sash Locks—**

See Locks, Sash.

**Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers**

See Stuffers or Fillers, Sausage.

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Saws—**

Atkins:	
Circular.....	50%
Band.....	50&10%
Butcher Saws.....	50%
Cross Cuts.....	35%
One-Man Cross Cut.....	40%
Narrow Cross Cut.....	50%
Hand, Rip and Panel.....	35&5%
Miter Box and Compass.....	40%
Mulay, Mill and Drag.....	50%
Chapin-Stephens Co.:	
Turning Saws and Frames.....	30&30&10%
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws.....	30&10&10%
Diston's:	
Circular, Solid and Ins'ted Tooth.....	50%
Hand, 2 to 18 in. wide.....	50%
Hand, 4 to 14.....	45%
Crosscuts.....	50%
Narrow Crosscuts.....	50%
Mulay, Mill and Drag.....	50%
Framed Woodsaws.....	25%
Woodsaw Blades.....	25%
Woodsaw Rods, Tinned.....	15%
Hand Saws, Nos. 12, 9, 9, 16, d100.....	25%
Hand Saws, Nos. 7, 10, 10, 10, 3, 1.....	25%
Combination.....	25%
Compass, Key Hole, &c.....	25%
Butcher Saws and Blades.....	30%
C. E. Jennings & Co.'s:	
Back Saws.....	25%
Butcher Saws.....	25%
Compass and Key Hole Saws.....	25%
Framed Wood Saws.....	30%
Hand Saws.....	20&2%
Wood Saw Blades.....	25%
Millers Falls:	
Butcher Saws.....	15&10%
Star Saw Blades.....	15&10%
Massachusetts Saw Works:	
Victor Kitchen Saws.....	40&10&50%
Butcher Saws.....	30&40%
Peace & Richardson's Hand Saws.....	30%
Simonds:	
Circular Saws.....	45%
Crescent Ground Cross Cut Saws.....	40%
One-Man Cross Cut Saws.....	45%
Gang Mill, Mulay and Drag Saws.....	45%
Band Saws.....	25&25&1%
Back Saws.....	25&25&1%
Butcher Saws.....	25&25&1%
Hand Saws.....	25&25&1%
Hand Saws, Bay State Brand.....	40%
Compass, Key Hole, &c.....	40&7%
Wood Saws.....	40&7%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws.....	50%

**Hack Saw Blades and Frames—**

Atkins' Hack Saw Blades A A A.....25%

Diston's:

Concave Blades.....25%

Keystone Blades.....25%

Hack Saw Frames.....20%

Simonds' File Co.....25%

C. E. Jennings &amp; Co.'s:

Hack Saw Frames, Nos. 175, 180.....40&amp;7%

Hack Saws, Nos. 175, 180, complete.....40&amp;7%

Goodell's Hack Saw Blades.....40&amp;10%

Griffin's Hack Saw Frames.....35&amp;5&amp;10%

Griffin's Hack Saw Blades.....35&amp;5&amp;10%

Star Hack Saws and Blades.....15&amp;10%

Sterling Hack Saw Blades.....30&amp;10&amp;5%

Sterling Hack Saw Frames.....30&amp;10&amp;10%

Sterling Power Hack Saw Machines.....

each, No. 1, \$25.00; No. 2, \$30.00.....10%

Victor Hack Saw Blades.....25%

Victor Hack Saw Frames.....20%

**Scroll—**

Barnes, No. 1, \$15.....25%

Barnes' Scroll Saw Blades.....40%

Barnes' Velocipede Power Scroll Saw.....

without boring attachment, \$18.....20%

Lester, complete, \$10.00.....15&amp;10%

Rogers, complete, \$3.50 and \$4.00.....15&amp;10%

**Scales—**

Family, Turnbull's.....50&amp;50&amp;10%

Counter:

Hatch, Platform, 1/4 oz. to 4.....

lbs.....dos. \$5.50

Two Platforms, 1/4 oz. to 4.....

lbs.....dos. \$16.00

Union Platform, Plain \$1.70 to \$1.90.....

Union Platform, Std. \$1.85 to \$2.15.....

Chatillon's:

Eureka.....25%

Favorite.....25%

Crocker's Trip Scale.....50%

Chicago Scale Co.:

The Little Detective.....25%

Union or Family No. 3.....25%

Portable Platform (reduced list).....50%

Vagon or Stock (reduced list).....25%

The Standard Portables.....45%

The Standard R. R. and Wag-.....

on.....50&amp;10%

**Scrapers—**

Box, 1 Handle.....dos. \$2.00 to \$2.25

Box, 2 Handle.....dos. \$3.50 to \$2.00

Ship.....Light, \$2.00; Heavy, \$4.50

Adjustable Box Scraper (S. R. &amp; L. Co.), \$4.00.....40%

Chapin-Stephens Co., Box.....30&amp;5&amp;10%

**Screws—Bench and Hand**

Bench, Iron, doz., 1 in., \$2.50 to

2.75; 1 1/2, \$3.00 to \$3.25; 1 3/4, \$3.50 to \$3.75

Bench, Wood.....20&amp;20&amp;10%

Hand, Wood.....20&amp;20&amp;10%

R. Bliss Mfg. Co., Hand.....20&amp;5&amp;10%

Chapin-Stephens Co., Hand.....20%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1,

99.....75&amp;15%

Coach, Gimlet Point, list

Oct. 1, 99.....75&amp;10%

Hand Rail, list Jan. 1, '81.....

70&amp;10&amp;75%

**Jack Screws—**

Standard List.....75%

Millers Falls.....50&amp;10&amp;10%

P. S. &amp; W.....50%

Swett Iron Works.....75&amp;80%

**Machine—**

List Jan. 1, '98:

Flat or Round Head, Iron.....

50&amp;50&amp;10%

Flat or Round Head, Brass.....

50&amp;50&amp;10%

**Set and Cap—**

Set (Iron).....75&amp;10&amp;7%

Set (Steel), net advance over

Iron.....25%

Sq. Hd. Cap.....70&amp;10&amp;7%

Hex. Hd. Cap.....70&amp;10&amp;7%

Rd. Hd. Cap.....50&amp;7%

Fillister Hd. Cap.....60&amp;7%

**Wood—**

List July 23, 1903.

Flat Head, Iron.....87&amp;5&amp;10&amp;5%

Round Head, Iron.....85&amp;5&amp;10&amp;5%

Flat Head, Brass.....82&amp;5&amp;10&amp;5%

Round Head, Brass.....80&amp;5&amp;10&amp;5%

Flat Head, Bronze.....77&amp;5&amp;10&amp;5%

Round Head, Bronze.....75&amp;5&amp;10&amp;5%

Drive Screws.....67&amp;5&amp;10&amp;5%

**Scroll Saws—**

See Saws, Scroll.

**Scythes—**

Per doz.

Grass, No. 1, Plain.....\$6.25 to \$6.75

Clipper, Bronzed Webb.....\$6.50 to \$7.00

No. 3 Clipper, Pol'd Webb.....

\$6.75 to \$7.25

No. 6 Clipper and Solid Steel.....

\$7.00 to \$7.50

Bush, Weed and Bramble, No. 2.....

\$6.50 to \$7.00

Grain, No. 1.....\$8.25 to \$8.75

Bronzed Webb, No. 1.....\$8.50 to \$9.00

Nos. 3 and 4 Clipper, Grain.....

\$8.75 to \$9.25

Solid Steel, No. 6.....\$9.25 to \$9.75

**Seeders, Raisin—**

Enterprise.....25&amp;30%

**Sets—Awl and Tool—**

Fray's Adj. Tool Handles, No. 1, \$12;

2, \$15; 3, \$12; 4, \$9; 5, \$7.....50%

C. E. Jennings &amp; Co.'s Model Tool

Holders.....30%

Millers Falls Adj. Tool Handles, No.

1, \$12; No. 4, \$12; No. 5, \$15.....15&amp;10%

**Garden Tool Sets—**

Ft. Madison Three Plows, Hoe, Rake

and Shovel.....\$9.00 to \$9.50

**Sets, Nail—**

Octagon.....gro. \$3.50 to \$3.75

Hack Bros.....25%

Cannon's Diamond Point, \$1.00 to \$1.25.....

Mayhew's Cor. galed, Cup Pt.....\$1.00 to \$1.25

Snell's Knurled, Cup Pt.....\$1.00 to \$1.25

Snell's Knurled, Cup Pt.....\$1.00 to \$1.25

Victor Knurled Cup Pt.....gro. \$7.50

**Rivet—**

Regular list.....75&amp;75&amp;10%

**Saw—**

Atkin's:

Criterion.....40%

Adjustable.....40%

Diston's Star, Monarch and Tri-

umph.....30%

Morrill's No. 1.....\$15.00

No. 3 and 4, Cross Cut.....\$20.00

No. 5, Mill.....\$30.00

No. 10, 11, 95.....\$15.00

No. 1 Old Style.....\$10.00

Special.....\$16.25

Giant Royal Cross Cut.....\$10.00

Royal Hand.....\$10.00

Taintor Positive.....\$10.00

Shaving—

Fox Shaving Sets, No. 30.....

\$10.00 to \$12.00

Smith &amp; Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel &amp; Mfg. Co.....70%

Pike Mfg. Co.:

Fast Cut Pocket Knife Hones.....\$1.50

Mounted Kitchen Sand Stone.....

\$1.50

Natural Grit Carving Knife.....\$3.00

Quick Cut Emery Carving

Knife Hones, \$1.00 to \$1.50.....

Quick Edge Pocket Knife

Hones, \$1.00 to \$1.50.....

Skate—

Smith &amp; Hemenway Co., Eureka.....20%

Shaves, Spoke—

Iron.....dos. \$1.10 to \$1.25

Wood.....dos. \$1.75 to \$2.25

Riley's (Stanley R. &amp; L. Co.).....45%

Razor Edge (Stanley R. &amp; L. Co.).....

Iron, 50%: Wood.....35%

Chapin-Stephens Co.....30&amp;30&amp;10&amp;10%

Goodell's \$10.00.....15&amp;10%

Wood's E1 and F2.....50%

Shears—

Cast Iron.....7 8 9 in.

Best.....\$16.00 18.00 20.00 gro.

Good.....\$13.00 15.00 17.00 gro.

Cheap.....\$5.00 6.00 7.00 gro.

Straight Trimmers, &amp;c.:

Best quality Jap.....\$10 to \$10 1/2

Best quality, Nickel.....\$6 to \$6 1/2

Fair quality, Jap.....\$6 to \$6 1/2

Fair quality, Nickel.....\$7 to \$7 1/2

Tailors' Shears.....40&amp;40&amp;10%

Acme Cast Shears.....40&amp;40&amp;5%

Heinisch's Tailors' Shears.....10%

Wilkinson Shear &amp; Cutlery Co.:

Sheet, 1900 list.....30&amp;10&amp;5%

Grass.....50&amp;10%

Horse or Mule.....50&amp;10%

**Tinners' Snips—**

Steel Blades.....20&amp;5&amp;20&amp;10%

Steel Laid Blades.....40&amp;10&amp;50%

Forged Handles, Steel Blades, Berlin.....

50%

Heinisch's Snips.....40%

Jennings &amp; Griffin Mfg. Co.'s 6 1/2 to

10 in.....50%

Niagara Snips.....40%

P. S. &amp; W. Forged Handles.....20%

**Pruning Shears—**

Cronk's Hand Shears.....33%

Cronk's Wood Handle Shears.....33%

Diston's Combined Pruning Hook

and Saw, \$1.00 to \$1.50.....25%

Diston's Pruning Hook only, \$1.00.....

\$12.00.....25%

John T. Henry Mfg. Co.:

Pruning Shears, all grades.....50%

P. S. &amp; W. Co.....30%

Wilkinson Shear &amp; Cutlery Co.:

Hedge, Wilcut Brand.....50&amp;10%

Lawn and Border.....60&amp;10%

**Sheaves—Sliding Door—**

Stowell's Anti-Friction.....50%

Reading.....40%

R. &amp; E. list.....15%

Wrightsville Hatfield Pattern.....80%

**Sliding Shutter—**

Reading list.....40%

R. &amp; E. list.....10%

**Shells—Shells, Empty—**

Brass Shells, Empty:

Climax, 10 and 12 gauge.....65&amp;10%

Club, Rival, 65&amp;5%; First Quality.....

60&amp;5%

Paper Shells, Empty:

New Rapid, 10, 12, 16 and 20 gauge.....

25&amp;10%

Climax, 10 and 12 gauge; Acme, 10,

12, 16 and 20 gauge; Ideal, 10, 12,

16 and 20 gauge; Leader grade.....

25&amp;5%

Union, League, 12 and 12 gauge.....

Rival Grade.....25%



<b>Scythe Stones—</b>	
Chicago Wheel & Mfg. Co.	
Gem, 10 in., \$3.00; 12 in., \$4.50.	
<b>North Alundum Scythe Stones:</b>	
Less than 10 gross lots, \$1.00 gro.	\$6.00
Lots of 10 gross or more, \$1.00 gro.	\$4.50
Pike Mfg. Co., 1901 list:	
Black Diamond S. S., 10 in.	\$12.00
Lamotte S. S., 10 in.	\$11.00
White Mountain S. S., 10 in.	\$9.00
Green Mountain S. S., 10 in.	\$8.00
Extra Indian Pond S. S., 10 in.	\$7.50
No. 1 Indian Pond S. S., 10 in.	\$7.00
No. 2 Indian Pond S. S., 10 in.	\$6.50
Leader Red End S. S., 10 in.	\$6.00
Quick Cut Emery, 10 in.	\$10.00
Pure Corundum, 10 in.	\$18.00
Crescent, 10 in.	\$7.00
Emery Scythe Rifles, 2 Coat, 10 in.	\$5.00
Emery Scythe Rifles, 3 Coat, 10 in.	\$10.00
Emery Scythe Rifles, 4 Coat, 10 in.	\$12.00
Balance of 1904 list 33 1/2%	
<b>Stoppers, Bottle—</b>	
Victor Bottle Stoppers, 10 in.	\$9.00
<b>Stops—Bench—</b>	
Millers Falls, 10 in.	\$15.00
Morrill's, No. 1, 10 in.	\$10.00
Morrill's, No. 2, 10 in.	\$12.00
<b>Door—</b>	
Chapin-Stephens Co., 10 in.	\$6.00
<b>Plane—</b>	
Chapin-Stephens Co., 10 in.	\$20.00
<b>Straps—Box—</b>	
Carr's Universal, case lots, 10 in.	\$20.00
<b>Stretchers, Carpet—</b>	
Cast Iron, Steel Points, doz.	\$6.00
Socket, 10 in.	\$11.00
Bullard, 10 in.	\$11.00
Excelsior Stretcher and Tack Hammer Combined, 10 in.	\$10.00
<b>Strops, Razor—</b>	
Star Diagonal Strop, 10 in.	\$5.00
<b>Stuffers, Sausage—</b>	
Enterprise Mfg. Co., 10 in.	\$2.00
National Specialty Co., list Jan. 1, 1902	\$3.00
<b>Sweepers, Carpet—</b>	
National Sweeper Co., 10 in.	\$10.00
Louis XV, Roller Bearing, Gold Plated, 10 in.	\$12.00
Hepplewhite, Roller Bearing, Silver Plated, 10 in.	\$12.00
Sheraton, Roller Bearing, Nickel, 10 in.	\$12.00
Ye Mission, Roller Bearing, Oxidized Copper, 10 in.	\$12.00
Transparent, Roller Bearing, Plate Glass top, Nickel, 10 in.	\$12.00
National Queen, Roller Bearing, Fancy Venetian, 10 in.	\$12.00
Loyal, Roller Bearing, Venetian, Nickel, 10 in.	\$12.00
Triple Medal, Roller Bearing, Nickel, 10 in.	\$12.00
Marion, Roller Bearing, Nickel, 10 in.	\$12.00
Marion Queen, Roller Bearing, Nickel, 10 in.	\$12.00
Monarch, Roller Bearing, Nickel, 10 in.	\$12.00
Perpetual, Regular B's, Nickel, 10 in.	\$12.00
Perpetual, Regular B's, Jap., 10 in.	\$12.00
Monarch Extra (17 in. case), Roller Bearing, Nickel, 10 in.	\$12.00
Monarch Extra (17 in. case), Roller Bearing, Japanned, 10 in.	\$12.00
Auditorium (30 in. case), Roller Bearing, Nickel, 10 in.	\$12.00
Mammoth (30 in. case), Roller Bearing, Nickel, 10 in.	\$12.00
<b>NOTE—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$3.50 per dozen on twenty-five dozen lots.</b>	
<b>Streator Metal Stamping Co.:</b>	
Eureka Japanned, 10 in.	\$15.00
Model B, Sanitary, 10 in.	\$25.00
Model A, Sterling, 10 in.	\$25.00
Model B, Sterling, Nickel, 10 in.	\$25.00
Model B, Sterling, Japanned, 10 in.	\$25.00
Model C, Sterling, 10 in.	\$25.00
Model D, Sterling, 10 in.	\$25.00
<b>Tacks, Finishing Nails, &amp;c.</b>	
<b>New List, May 1, 1905.</b>	
American Carpet Tacks, 10 in.	\$0.45
American Cut Tacks, 10 in.	\$0.45
Svedes Cut Tacks, 10 in.	\$0.45
Svedes Upholsterers', 10 in.	\$0.45
Gimp Tacks, 10 in.	\$0.45
Lace Tacks, 10 in.	\$0.45
Trimmers' Tacks, 10 in.	\$0.45
Looking Glass Tacks, 10 in.	\$0.45
Bill Posters' and Railroad Tacks, 10 in.	\$0.45
Finishing Nails, 10 in.	\$0.45
Trunk and Clout Nails, 10 in.	\$0.45
<b>NOTE—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10% is given on light weights.</b>	
<b>Miscellaneous—</b>	
Double Pointed Tacks, 10 in.	\$0.45
<b>See also Nails, Wire.</b>	
<b>Tanks, Oil—</b>	
Emerald, R. M. Co., 10 gal.	\$3.40
Emerald, R. M. Co., 20 gal.	\$4.25
Queen City, R. M. Co., 10 gal.	\$3.65
Queen City, R. M. Co., 20 gal.	\$4.50
<b>Tapes, Measuring—</b>	
American Asses' Skin, 10 in.	\$0.50
Patent Leather, 10 in.	\$0.50
Steel, 10 in.	\$0.50
Chesterman's, 10 in.	\$0.50
Keuffel & Esser Co., 10 in.	\$0.50
Favorite, Ass Skin, 10 in.	\$0.50
Favorite, Duck and Leather, 10 in.	\$0.50
Metallic and Steel, lower list, 10 in.	\$0.50
Lufkin's, 10 in.	\$0.50
Asses' Skin, 10 in.	\$0.50

<b>Metallic—</b>	
Patent Bend, Leather, 10 in.	\$0.50
Pocket, 10 in.	\$0.50
Wiebusch & Hilger:	
Chesterman's Metallic, No. 34L, etc.	\$0.50
Chesterman's Steel, No. 108L, etc.	\$0.50
<b>Teeth, Harrow—</b>	
Steel Harrow Teeth, plain or headed, 1/2-inch and larger, per 100 lbs.	\$2.75 to \$3.00
<b>Thermometers—</b>	
Tin Case, 10 in.	\$0.50
<b>Ties, Bale—Steel Wire—</b>	
Single Loop, 10 in.	\$0.50
Monitor, Cross Head, 10 in.	\$0.70
<b>Brick Tiles—</b>	
Niagara Brick Tiles, 10 in.	\$0.50
<b>Tinners' Shears, &amp;c.—</b>	
See Shears, Tinners', &c.	
<b>Tinware—</b>	
Stamped, Japanned and Piced, sold very generally at net prices.	
<b>Tire Benders, Upsetters, &amp;c.—</b>	
See Benders and Upsetters, Tire.	
<b>Tools—Coopers'—</b>	
L. & I. J. White, 10 in.	\$0.50
<b>Hay—</b>	
Myers' Hay Tools, 10 in.	\$0.50
Stowell's Hay Carriers, 10 in.	\$0.50
Fork, 10 in.	\$0.50
<b>Miniature—</b>	
Smith & Hemenway Co's, David-son	\$0.50
<b>Saw—</b>	
Atkins' Cross Cut Saw Tools, 10 in.	\$0.50
Simonds' Improved, 10 in.	\$0.50
Simonds' Crescent, 10 in.	\$0.50
<b>Ship—</b>	
L. & I. J. White, 10 in.	\$0.50
<b>Transom Lifters—</b>	
See Lifters, Transom.	
<b>Traps—Fly—</b>	
Balloon, Globe or Acme, doz.	\$1.50
Harper, Champion or Paragon, doz.	\$1.25
Imitation Oneida, 10 in.	\$0.75
Newhouse, 10 in.	\$0.75
Hawley & Norton, 10 in.	\$0.75
Victor, 10 in.	\$0.75
Oneida Community Jump, 10 in.	\$0.50
<b>Mouse and Rat—</b>	
Mouse, Wood, Choker, doz. holes	\$0.50
Mouse, Round or Square Wire, doz.	\$0.50
Marty French Rat and Mouse Trap (Genuine):	
No. 1, Rat, 10 in.	\$13.25
No. 2, Rat, 10 in.	\$11.50
No. 3, Rat, 10 in.	\$8.50
No. 3 1/2, Rat, 10 in.	\$5.25
No. 4, Mouse, 10 in.	\$3.25
No. 5, Mouse, 10 in.	\$3.00
<b>Trimmers, Spoke—</b>	
Wood's E, 10 in.	\$0.50
<b>Trowels—</b>	
Diaton Brick and Pointing, 10 in.	\$0.25
Diaton Plastering, 10 in.	\$0.20
Diaton "Standard Brand" and Garden Trowels, 10 in.	\$0.30
Kohler's Steel Garden Trowels, 10 in.	\$0.30
Never-Break Steel Garden Trowels, 10 in.	\$0.30
Rose Brick and Plastering, 10 in.	\$0.25
Woodrough & McParlin, Plastering, 10 in.	\$0.25
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.:	
New York Pattern, 10 in.	\$0.50
Western Pattern, 10 in.	\$0.50
Handy Trucks, 10 in.	\$0.50
Grocery, 10 in.	\$0.50
Daisy Stove Trucks, Improved Pattern, 10 in.	\$0.50
McKinney Trucks, 10 in.	\$0.50
Model Stove Trucks, 10 in.	\$0.50
<b>Tubs, Wash—</b>	
M'For's list, price per gross.	
No. 1, 10 in.	\$0.50
No. 2, 10 in.	\$0.50
No. 3, 10 in.	\$0.50
No. 4, 10 in.	\$0.50
No. 5, 10 in.	\$0.50
No. 6, 10 in.	\$0.50
No. 7, 10 in.	\$0.50
No. 8, 10 in.	\$0.50
No. 9, 10 in.	\$0.50
No. 10, 10 in.	\$0.50
No. 11, 10 in.	\$0.50
No. 12, 10 in.	\$0.50
No. 13, 10 in.	\$0.50
No. 14, 10 in.	\$0.50
No. 15, 10 in.	\$0.50
No. 16, 10 in.	\$0.50
No. 17, 10 in.	\$0.50
No. 18, 10 in.	\$0.50
No. 19, 10 in.	\$0.50
No. 20, 10 in.	\$0.50
No. 21, 10 in.	\$0.50
No. 22, 10 in.	\$0.50
No. 23, 10 in.	\$0.50
No. 24, 10 in.	\$0.50
No. 25, 10 in.	\$0.50
No. 26, 10 in.	\$0.50
No. 27, 10 in.	\$0.50
No. 28, 10 in.	\$0.50
No. 29, 10 in.	\$0.50
No. 30, 10 in.	\$0.50
No. 31, 10 in.	\$0.50
No. 32, 10 in.	\$0.50
No. 33, 10 in.	\$0.50
No. 34, 10 in.	\$0.50
No. 35, 10 in.	\$0.50
No. 36, 10 in.	\$0.50
No. 37, 10 in.	\$0.50
No. 38, 10 in.	\$0.50
No. 39, 10 in.	\$0.50
No. 40, 10 in.	\$0.50
No. 41, 10 in.	\$0.50
No. 42, 10 in.	\$0.50
No. 43, 10 in.	\$0.50
No. 44, 10 in.	\$0.50
No. 45, 10 in.	\$0.50
No. 46, 10 in.	\$0.50
No. 47, 10 in.	\$0.50
No. 48, 10 in.	\$0.50
No. 49, 10 in.	\$0.50
No. 50, 10 in.	\$0.50
No. 51, 10 in.	\$0.50
No. 52, 10 in.	\$0.50
No. 53, 10 in.	\$0.50
No. 54, 10 in.	\$0.50
No. 55, 10 in.	\$0.50
No. 56, 10 in.	\$0.50
No. 57, 10 in.	\$0.50
No. 58, 10 in.	\$0.50
No. 59, 10 in.	\$0.50
No. 60, 10 in.	\$0.50
No. 61, 10 in.	\$0.50
No. 62, 10 in.	\$0.50
No. 63, 10 in.	\$0.50
No. 64, 10 in.	\$0.50
No. 65, 10 in.	\$0.50
No. 66, 10 in.	\$0.50
No. 67, 10 in.	\$0.50
No. 68, 10 in.	\$0.50
No. 69, 10 in.	\$0.50
No. 70, 10 in.	\$0.50
No. 71, 10 in.	\$0.50
No. 72, 10 in.	\$0.50
No. 73, 10 in.	\$0.50
No. 74, 10 in.	\$0.50
No. 75, 10 in.	\$0.50
No. 76, 10 in.	\$0.50
No. 77, 10 in.	\$0.50
No. 78, 10 in.	\$0.50
No. 79, 10 in.	\$0.50
No. 80, 10 in.	\$0.50
No. 81, 10 in.	\$0.50
No. 82, 10 in.	\$0.50
No. 83, 10 in.	\$0.50
No. 84, 10 in.	\$0.50
No. 85, 10 in.	\$0.50
No. 86, 10 in.	\$0.50
No. 87, 10 in.	\$0.50
No. 88, 10 in.	\$0.50
No. 89, 10 in.	\$0.50
No. 90, 10 in.	\$0.50
No. 91, 10 in.	\$0.50
No. 92, 10 in.	\$0.50
No. 93, 10 in.	\$0.50
No. 94, 10 in.	\$0.50
No. 95, 10 in.	\$0.50
No. 96, 10 in.	\$0.50
No. 97, 10 in.	\$0.50
No. 98, 10 in.	\$0.50
No. 99, 10 in.	\$0.50
No. 100, 10 in.	\$0.50
<b>Twine, Miscellaneous—</b>	
Flax Twine:	
No. 1, 1/2 and 1 1/4 lb. Balls, 22¢	\$2.40
No. 2, 1/2 and 1 1/4 lb. Balls, 20¢	\$2.16
No. 3, 1/2 and 1 1/4 lb. Balls, 17¢	\$1.92
No. 4, 1/2 and 1 1/4 lb. Balls, 16¢	\$1.80
No. 5, 1/2 and 1 1/4 lb. Balls, 15¢	\$1.70
Chalk Line, Cotton 1/2 lb.	\$0.25
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	\$10.00
Cotton Wrapping, 5 Balls to lb., according to quality.	\$1.15
American 2-Ply Hemp, 1/2 and 1 1/4 lb. Balls, 13¢	\$1.56
American 3-Ply Hemp, 1/2 lb. Balls, 11¢	\$1.32
India 2-Ply Hemp, 1/2 and 1 1/4 lb. Balls (Spring Twine), 9¢	\$1.08
India 3-Ply Hemp, 1/2 lb. Balls, 9¢	\$1.08
India 3-Ply Hemp, 1 1/4 lb. Balls, 9¢	\$1.08
3, 3 1/2 and 5-Ply Jute, 1/2 lb. Balls, 11¢	\$1.32
Mason Line, Linen, 1/2 lb. Balls, 16¢	\$1.92
No. 264 Mattress, 1/2 and 1 1/4 lb. Balls, according to quality.	\$0.60
Wool, 3 to 6 ply, 1/2 lb. Balls, 7¢	\$0.84
<b>Vises—</b>	
Solid Box, 10 in.	\$0.50

Parallel—

Athol Machine Co.:

Simpson's Adjustable.....40%

Standard.....40%

Amateur.....25%

Columbia, Co.....40%

Emmert Universal:

Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.

Machinist and Tool Makers' No. 1A, \$12.50; No. 6A, \$10.00; No. 10A, \$22.50.

Presto Quick Acting Adjustable Jaw, 25x25x10%; Solid Jaw 35x35x10%

Tiger Machinists'.....40%

Fisher & Norris Double Screw, net, each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.

Holland:

Machinists'.....100x45%

Keystone.....65x40%

Lewis Tool Co.:

Adjustable Jaw.....30%

Monarch, 50%; Solid Jaw.....50%

Massey Vise Co.:

Clincher.....40%

Perfect, 15%; Lightning Grip.....15%

Merrill's.....15%

Millers Falls Oval Slide Pattern.....60x10%

Parker's:

Victor, 20x25%; Regulars.....20x25%

Vulcan.....40x45%

Combination Pipe.....50x60%

Prentiss.....20x25%

Snediker's X. L.....33%

Stephens'.....33%

Saw Filers—

Diston's D 3 Clamp and Guide, 30 doz., \$24.00, 30%; Clamps.....30%

Perfection Saw Clamps, 1/2 doz.....41.50

Reading.....60

Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....50%

Wood Workers—

Massey Vise Co.:

Lightning Grip, 15%; Perfect.....15%

Wyman & Gordon's Quick Action, 6 in., \$4.00; 9 in., \$7.00; 14 in., \$8.00.

Miscellaneous—

Holland's Combination Pipe.....60x60x5%

Massey's Quick Action Pipe.....40%

Parker's Combination Pipe:

87 Series, 60%; 187 Series, 60x5%; No. 870, 40%.

Wads—Price per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....\$1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger.....\$1.70(1.75)

Ely's P. E., 12 to 20.....\$3.00(3.25)

Ware, Hollow—

Cast Iron, Hollow—

Store Hollow Ware:

Enameled.....45x10%

Ground.....50x5%

Plain or Unground.....60%

Country Hollow Ware, per 100 lbs.....\$2.75

White Enameled Ware:

Maslin Kettles.....65x10%

Covered Ware:

Tinned and Turned.....35x10%

Enameled.....45x10%

See also Pots, Glue.

Enameled—

Agate Nickel Steel Ware.....60%

Iron Clad Ware.....70x10%

Lava, Enameled.....40x10%

Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....6 7 8 9

Each......5¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles.....65x50%

Avery Kettles.....50x50%

Porcelain.....50x50x10%

Never Break Spiders and Griddles.....60x5%

Never Break Kettles.....60%

Solid Steel Spiders and Griddles.....65x5%

Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone.....40x40x10%

Washboards—

Solid Zinc:

Crescent, family size, bent frame,\$3.70

Red Star, family size, stationary protector.....\$3.70

Double Zinc Surface:

Saginaw Globe, family size, stationary protector.....\$3.25

Cable Cross, family size, stationary protector.....\$3.40

Single Zinc Surface:

Nalad, family size, open back.....\$2.90

Perforated.....\$2.90

Single Saginaw Globe.....\$2.75

Brass Surface:

Brass King, Single Surface, open back.....\$3.65

Nickel Plate Surface:

No. 1001 Nickel Plate, Single Surface.....\$1.65

Glass Surface:

Glass King, Single Surface, open back.....\$1.65

Enamel Surface:

Enamel King, Single Surface, ventilated back.....\$3.65

Washers—Leather, 10x10—

Solid......80x10(90x10x10)

Patent......90x90(65x)

Coll: 1/4 1 1 1/4 1 1/4 Inch.

10¢ 11¢ 12¢ 14¢ per doz

Iron or Steel—

Size bolt...5-16 3/4 1 1/4 3/4

Washers...\$3.60 4.70 3.40 3.20 3.00

The above prices are based on \$5.00 off list.

